HITACHI

SERVICE MANUAL

TK | No. 0502E

DZ-GX20A
DZ-MV780A
DZ-MV730A

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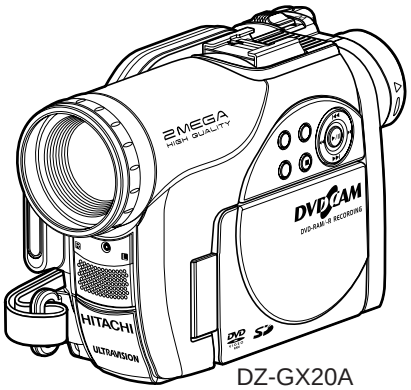
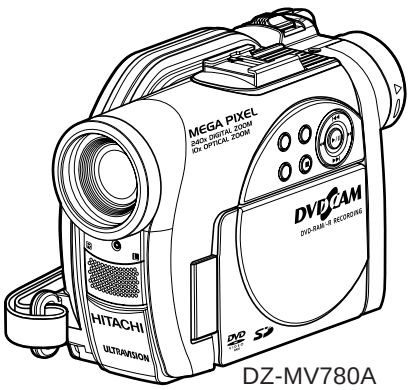
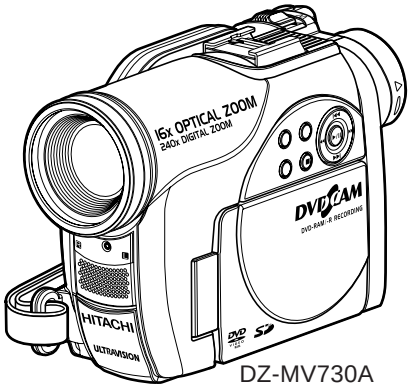


DZ-GX20A



DZ-MV780A



DZ-MV730A

During the product warranty period, please contact 1.800.HITACHI (800.448.2244) for guidance.

DO NOT RESELL OR DIVERT IMPROPERLY

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

DVD VIDEO CAMERA/RECORDER

February 2005 Digital Media Division,Tokai

Version 0502E.1

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Information:
The two types of AEL circuit board are shown, since the circuit board is changed during mass-production.
Check the pattern no. printed on the circuit board when repairing.

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1 Safety Precaution for Repair

1-1 Cautions

CAUTION

Lithium battery; danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the equipment manufacturer. Discard used batteries according to manufacturer's instructions.

When replacing the lithium battery it is important to use the same type and connect it correctly.

WARNING:

- Lithium batteries contain dangerous chemicals.
- Handle and dispose of with great care.
- Do not throw in a fire.
- Do not short circuit it.
- For disposal place in a plastic bag and put in waste bin.

PRODUCT SAFETY NOTICE

Many electrical and mechanical parts have special safety-related characteristics. These are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for a higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual. Electrical components having such features are identified by marking with a ⚠ on the schematics and the parts list in this Service Manual. The use of a substitute replacement component which does not have the same safety characteristics as the HITACHI recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards. Product safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current HITACHI Service Manual. A subscription to, or additional copies for, HITACHI Service Manual may be obtained at a nominal charge from HITACHI SALES CORPORATION.

CLASS 1
LASER PRODUCT

CAUTION

This product contains a laser diode of higher class than 1. To ensure continued safety, do not remove any covers or attempt to gain access to the inside of the product. Refer all servicing to qualified personnel.

CAUTION

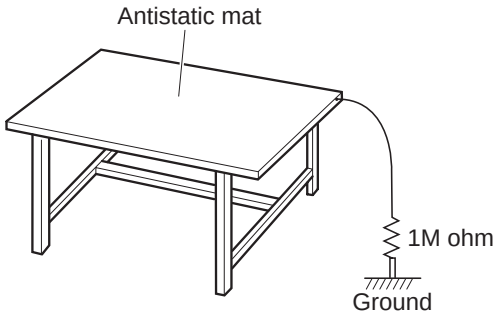
There is a high-voltage section inside the DVD video camera/recorder: When repairing or inspecting it, take great care to prevent electric shock: Use an isolating transformer, wear gloves, etc.

1-2 Electrostatic Protection Measures

Semiconductor components can be damaged by static electricity charged on clothes, human body, etc. Take great care when handling components to avoid electrostatic damage, and perform servicing in an environment where grounding is complete.

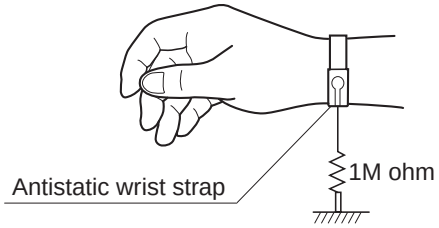
(1) Grounding work bench

Lay out an antistatic mat on work bench, and then use the ground plate to ground the work bench.



(2) Grounding human body

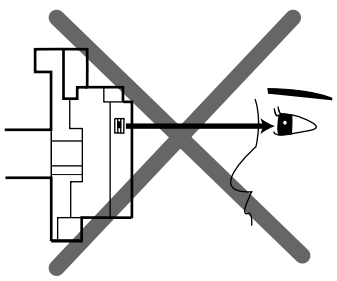
Use an antistatic wrist strap to discharge any static electricity charged on the body. Also, use a tester for wrist strap to make sure that the wrist strap is working normally. Note, however, that static electricity charged on clothes will not be discharged by wrist strap: Therefore do not allow your clothes to touch the semiconductor components.



1-3 Cautions When Handling DVD Drive

The optical pickup in DVD drive has a high precision structure: Be sure to observe the following cautions.

1) Do not subject optical pickups to any severe vibrations or impact during movement, installation or disassembly.
2) When performing repair work, do not perform disassembly any further than that described in this manual.
3) Never turn the semi-variable resistors for adjustment in optical pickup or DVD drive.
4) NEVER look into the objective lens in optical pickup or directly view the laser light: You could lose your eyesight.



Do not directly look at laser light from pickup.

1-4 Lead-Free Solder

The printed circuit board that uses lead-free solder is adopted. To protect the global environment, use the recommended lead-free solder also during servicing.
Read and observe the following before soldering:

Caution
ALWAYS wear protective goggles during soldering so that no solder smoke or scattered solder enters the eye. Lead-free solder may scatter at high temperatures of 600°C.

(1) Identification of circuit boards that use lead-free solder

"F" is stamped or noted with pattern letter on circuit boards that use lead-free solder.

(2) Characteristics of lead-free solder

The components of lead-free solder used are as follows. The melting point of lead-free solder is 30-40°C higher than that of lead based solder:

Point to be soldered	Composition of alloy (wt%)
For reflow	Solder paste: Sn-3Ag-0.5Cu
For dip	Bar solder: Sn-0.6Cu

Melting temperature: Approx. 220°C

(3) Lead-free solder for servicing

Use the following lead-free solder for servicing:
Recommended lead-free solder and composition of alloy (wt%): Sn-3.0Ag-0.5Cu or equivalent

Information:
For composition of alloy, Sn is tin; Ag is silver; Cu is copper; Bi is bismuth; Pb is lead.

(4) Soldering iron for servicing

The temperature of soldering iron tip must be adjusted according to the points to be soldered: Use an antistatic soldering iron with thermal control function.
When removing components, take care not to damage any surrounding component or pattern. When attaching components, observe the heating time in the following table so that the components are not destroyed by heat.

Tip temperatures for different soldering points:

Point to be soldered	Tip temperature
Surface-mounted (chip) parts [other than those shown below]	320 ± 30°C [heating time: less than 5 seconds]
Surface-mounted (chip) parts [for DVD cameras, cellular phones only]	350 ± 10°C [heating time: less than 3 seconds]
Discrete parts	380 ± 30°C
Chassis, metal shield, etc.	420 ± 30°C

(5) Cautions when using lead based solder

It is recommended that you use lead-free solder when servicing, but it is also possible to service using lead based solder. However, if lead based solder is used for servicing, take care with the following:

1) Before using lead based solder, remove the lead-free solder completely from the point to be soldered.
2) For additional soldering for repair, set the soldering iron tip temperature for lead-free solder, mix lead based solder and lead-free solder sufficiently. Do not perform any repair using the bare soldering iron tip without adding solder, since it will cause secondary failure due to lack of strength.

1-5 Notes When Using Service Manual

(1) Value units used in parts list

Certain symbols are indicated as shown below for value units of resistors, capacitors and coils in parts list. When you read them, note the following regular indications:

Parts	Indication in list	Regular indication
Resistor	KOHM	kΩ
Capacitor	UF	μF
	PF	pF
Coil	UH	μH
	MH	mH

(2) Values in schematic diagrams

The values, dielectric strength (power capacitance) and tolerances of the resistors (excluding variable resistors) and capacitors are indicated in the schematic diagrams using abbreviations. Certain symbols are indicated for value units: When you read them note the regular indications in tables below:

[Resistors]

Item	Indication
Value	No indication ..... Ω K ..... kΩ M ..... MΩ
Tolerance	No indication ..... ±5% (All tolerances other than ±5% are indicated in schematic diagrams)
Power capacitance	No indication ..... 1/8W (1/16 W for leadless resistors with no indication) All capacitances other than the above are indicated in schematic diagrams.

[Capacitors]

Item	Indication
Value	No indication ..... μF P ..... pF
Dielectric strength	No indication ..... 50V (All dielectric strengths other than 50 V are indicated in schematic diagrams)

[Coils]

Item	Indication
Value	μ ..... μH m ..... mH

(3) Identifying sides A/B in circuit board diagrams

1) Board with pattern on one side only and parts on both sides:

Side A: Shows discrete parts.

Side B: Shows leadless parts, viewed from the pattern side.

2) Board with patterns and parts on both sides:

Side A: Shows parts and patterns which can be seen when the case is opened.

Side B: Shows the parts and the pattern on the back of side A.

(4) Indicating model names

The indication of models is defined as follows:

1) The common parts of model names are omitted.

Example: When indicating VM-D975LA and VM-D875LA:

VM-D975LA/D875LA, D975LA/D875LA

2) If there is no difference in models going to different destinations, the indication of destination is omitted.

Example: When indicating DZ-MV350E(AU) and DZ-MV350E(SW): DZ-MV350E

(5) Differences in parts between schematic and circuit board diagrams

If parts differ between models, asterisks * are attached to circuit numbers.

See parts difference tables in diagrams for details.

2 General Description

2-1 Overview

New models DZ-GX20A and DZ-MV780A/MV730A do not require a round DVD holder for disc.
The DZ-GX20A and DZ-MV780A have high-performance CCD image sensors with a total of approx. 2,120,000 pixels and 1,330,000 pixels; both are equipped with a high-performance optical 10-power zoom.
The DZ-MV730A has a CCD image sensor with a total of 680,000 pixels and an optical 16-power zoom.

2-1-1 Servicing method

Refer to the following table and perform the designated, appropriate servicing. Any changes that occur in the service method will be published using service bulletin, etc.
Do not perform any servicing other than that described in this manual.

Information:
The suffixes of circuit board names – "-H", "-L" and "-M" – show the models in which the circuit boards are used: "-H" is for DZ-GX20A; "-L" for DZ-MV730A; and "-M" for DZ-MV780A.

Parts Name	Servicing method
Disc drive unit	Unit replacement. (Which incorporates the DRV and HDL5 circuit boards.)
Lens unit	Unit replacement.
EVF unit	Unit replacement.
LCD unit	Unit replacement. (Which incorporates the LCD and MR circuit boards.)
AEL circuit board	Component replacement: The following components are excluded. If they are faulty, replace the mounting circuit boards. CSP ICs Leadless (chip) resistors Leadless (chip) capacitors
AVJ-H/AVJ-L/AVJ-M circuit board	
DRF-H/DRF-L/DRF-M circuit board(*1)	
FRT-H/FRT-L/FRT-M circuit board	
GSL-H/GSL-L/GSL-M circuit board	
MAN circuit board	
SHE-H/SHE-M circuit board	

*1: Film type board that connects MAN circuit board and disc drive unit.

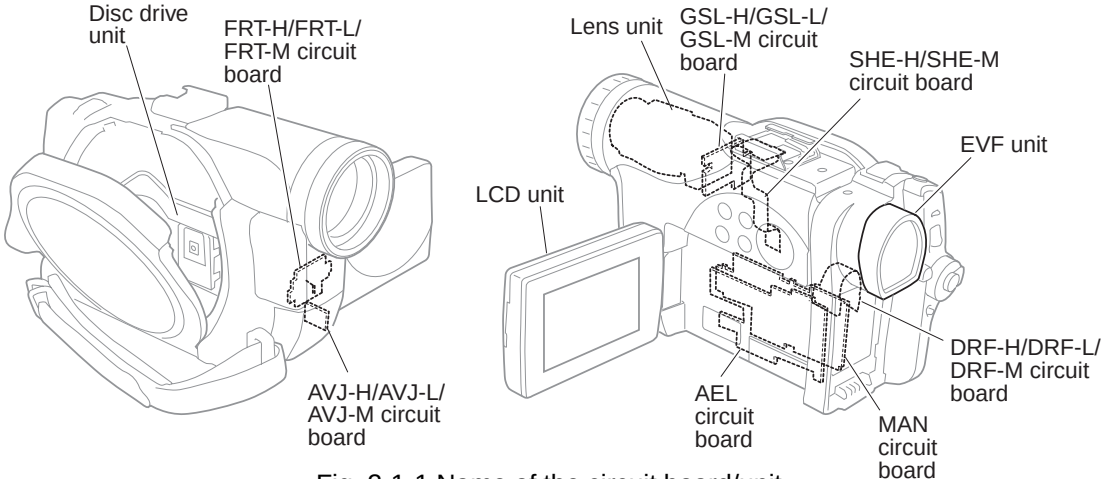


Fig. 2-1-1 Name of the circuit board/unit

2-2 Features

High image-quality recording:

The DZ-GX20A and DZ-MV780A are equipped with a CCD image sensors of approx. 2,120,000 pixels and 1,330,000 pixels.

Recording in XTRA (VBR) mode is possible not only on DVD-RAM but also on DVD-R.

Compatible with 16:9 wide-screen:

Recording (camera and external input) with 16:9 aspect ratio is possible using the reserved pixels.

Quick start function:

Even if the power switch is set to "OFF", loading a disc will immediately start its recognition: This allows user to take full advantage of opportunities for recording.

Assistant light and flash:

When recording videos in dark places, the LCD monitor screen will serve as an additional light.

The DZ-GX20A incorporates a flash for recording photos in dark places.

2-3 Specifications

Item			Specifications
CCD Image Sensor		DZ-GX20A	1/3.6-inch interlaced
		DZ-MV780A	1/4.5-inch interlaced
		DZ-MV730A	1/6-inch interlaced
	Total number of pixels	DZ-GX20A	Approx. 2,120,000
		DZ-MV780A	Approx. 1,330,000
		DZ-MV730A	Approx. 680,000
	Number of effective pixels	DZ-GX20A	Video: Approx. 1,230,000 Photo: Approx. 1,920,000
		DZ-MV780A	Video: Approx. 690,000 Photo: Approx. 1,100,000
		DZ-MV730A	Video: Approx. 340,000 Photo: Approx. 340,000
Lens		DZ-GX20A	F1.8 - 2.2, f = 3/16" - 1-3/4" (4.5 - 45 mm)
		DZ-MV780A	F1.8 - 2.3, f = 1/8" - 1-1/4" (3.2 - 32 mm)
		DZ-MV730A	F1.6 - 2.3, f = 1/8" - 1-1/16" (2.7 - 43.2 mm)
	Filter diameter/ Thread pitch	DZ-GX20A	1-5/16" (34 mm) / 0.5mm
		DZ-MV780A	1-1/4" (30.5 mm) / 0.5mm
		DZ-MV730A	1-5/16" (34 mm) / 0.5mm
Focus			Auto/Manual
Zoom		DZ-GX20A	Optical 10×, 240× with digital zoom added (40× for photo)
		DZ-MV780A	
		DZ-MV730A	Optical 16×, 240× with digital zoom added (40× for photo)
Required minimum illumination		DZ-GX20A	24 lx (1 lx in Low light mode)
		DZ-MV780A	15 lx (1 lx in Low light mode)
		DZ-MV730A	12 lx (1 lx in Low light mode)
Viewfinder			0.2-inch color (equivalent to approx. 200,000 pixels)
LCD monitor			2.5-inch color TFT (approx. 120,000 pixels)
Image Stabilizer			Electronic Type
Shutter speed			1/4 - 1/4000 second (video)
Self-timer recording			Photo recording only

Item			Specifications
External microphone jack			Ø 3.5 mm stereo mini-jack (a plug-in power type microphone cannot be used)
Recording mode			Video with audio (DVD-RAM, DVD-R) Photo (DVD-RAM, SD memory card)
Maximum time of recordable video	DVD-RAM/DVD-R (per side)		XTRA mode: Approx. 18 min. FINE mode: Approx. 30 min. STD mode: Approx. 60 min.
Maximum number of recordable photos	DVD-RAM (per side)	DZ-GX20A	Approx. 750(*1)
		DZ-MV780A	Approx. 999(*1)
		DZ-MV730A	
	SD memory Card (32MB)	DZ-GX20A	Approx. 29 (in FINE mode)(*2)
		DZ-MV780A	Approx. 58 (in FINE mode)(*2)
		DZ-MV730A	Approx. 232 (in FINE mode)(*2)
Recording format	DVD-RAM		Video: Conforming to DVD video recording (DVD-VR) format Audio: Dolby Digital Photo: Simultaneous recording, conforming to JPEG format (DZ-GX20: 1600 × 1200 pixels, DZ-MV780A: 1280 × 960 pixels, DZ-MV730A: 640 × 480 pixels) and DVD video recording (DVD-VR) format (704 × 480 pixels). [JPEG of external input: 640 × 480 pixels]
	DVD-R		Video: Conforming to DVD video format Audio: Dolby Digital
	Card		Photo: Conforming to JPEG (DZ-GX20: 1600 × 1200 pixels, DZ-MV780A: 1280 × 960 pixels, DZ-MV730A: 640 × 480 pixels) format [External input: 640 × 480 pixels]
Audio playback format			Dolby Digital, MPEG Audio layer 2, Linear PCM (LPCM)
Recording media			8 cm DVD-RAM (conforming to DVD-RAM Ver. 2.1) 8 cm DVD-R (conforming to DVD-R for General Ver. 2.0) SD memory card
Jacks			Video/audio input/output × 1 External microphone input × 1 PC connection terminal (connected to PC USB port) × 1 [PC connection terminal is not provided with DZ-MV730A]
Battery system			Lithium-ion
Power consumption (when recording with LCD monitor off)		DZ-GX20A	Approx. 4.4 W (DVD-RAM used, FINE mode)
		DZ-MV780A	Approx. 3.8 W (DVD-RAM used, FINE mode)
		DZ-MV730A	Approx. 3.2 W (DVD-RAM used, FINE mode)
Dimensions (W × H × D, excluding projections)		DZ-GX20A	Approx. 2" × 3-9/16" × 5-3/8" (51 × 90 × 137 mm)
		DZ-MV780A	Approx. 2" × 3-3/8" × 4-13/16" (51 × 86 × 123 mm)
		DZ-MV730A	Approx. 2" × 3-1/2" × 5-1/4" (51 × 89 × 133 mm)
Operating temperature (humidity)			32 - 104°F (0 - 40°C) (less than 80%) 32 - 86°F (0 - 30°C) when connected to PC
Storage temperature			-4 - 104°F (-20 - 60°C)

*1: The number may decrease when videos are recorded on DVD-RAM, depending on the amount of recorded data.

*2: May vary depending on the image quality.

Item		Specifications
Weight (without battery and disc)	DZ-GX20A	Approx. 480 g
	DZ-MV780A	Approx. 420 g
	DZ-MV730A	Approx. 450 g
Total weight when recording (when using DZ-BP14S battery)	DZ-GX20A	Approx. 555 g (when using DZ-BP14S battery)
	DZ-MV780A	Approx. 495 g (when using DZ-BP7S battery)
	DZ-MV730A	Approx. 525 g (when using DZ-BP7S battery)
Provided accessories		AC adapter/charger (DZ-ACS2) Battery [DZ-GX20A: DZ-BP14S, DZ-MV780A /MV730A: DZ-BP7S] AV/S input/output cable Infrared remote control (DZ-RM4W) [not provided with DZ-MV730A] Lithium battery for remote control (CR2032) [not provided with DZ-MV730A] Lens cap Lens cap string Shoulder strap Power cable DC power cord Software CD-ROM [not provided with DZ-MV730A] PC connection cable [not provided with DZ-MV730A] Single-sided 8cm DVD-RAM [not provided with DZ-MV730A] Disc cleaning cloth

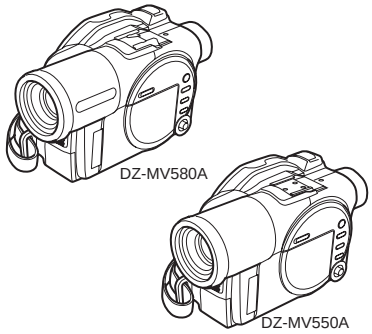
Specifications are subject to change without notice for the purpose of improvement.

Specifications of DZ-ACS2 AC Adapter/Charger

Power supply	100 - 240 V AC, 50/60 Hz
Input capacity	26 VA (at 100 V)
DC output (max.)	7.9 V, 1.4 A
Charge output	8.4 V, 0.65A
Weight	105 g
External dimensions (W x H x D)	61 × 32 × 91 mm
Ambient temperature for operation	32 - 104°F (5 - 35°C)
Allowable relative humidity	40 - 80%

2-4 Major Differences from Previous Models

←— : Same as on left

Item		DZ-GX20A/MV780A/MV730A	DZ-MV580A/MV550A
Dimensions (W × H × D) and shape		DZ-GX20A: Approx. 2" × 3-9/16" × 5-3/8" DZ-MV780A: Approx. 2" × 3-3/8" × 4-13/16" DZ-MV730A: Approx. 2" × 3-1/2" × 5-1/4" DZ-GX20A DZ-MV780A DZ-MV730A	DZ-MV580A: Approx. 2-1/2" × 3-1/2" × 5-3/4" DZ-MV550A: Approx. 2-1/2" × 3-1/2" × 5-3/4"  DZ-MV580A DZ-MV550A
Disc holder		Disused	Used
Card		SD memory card	SD memory card MultiMediaCard
Internal flash		DZ-GX20A: Provided	Not provided
		DZ-MV780A/MV730A: Not provided	
Assist light funtion		Provided (When Low Light mode is selected)	Not provided
16:9 mode		Provided (Except for DVD-R using, STD mode)	Provided (When using DVD-RAM)
Quick start function		Provided	Not provided
CCD		DZ-GX20A: 1/3.6-inch interlaced	----------
		DZ-MV780A: 1/4.5-inch interlaced	DZ-MV580A: 1/3.8-inch interlaced
		DZ-MV730A: 1/6-inch interlaced	DZ-MV550A: ←—
	Total number of pixels	DZ-GX20A: Approx. 2,120,000 pixels	
		DZ-MV780A: Approx. 1,330,000 pixels	DZ-MV580A: Approx. 1,020,000 pixels
		DZ-MV730A: Approx. 680,000 pixels	DZ-MV550A: ←—
	Number of effective pixels	DZ-GX20A: Video: Approx. 1,230,000 pixels Photo: Approx. 1,920,000 pixels	----------
		DZ-MV780A: Video: Approx. 690,000 pixels Photo: Approx. 1,100,000 pixels	DZ-MV580A: Video: Approx. 400,000 pixels Photo: Approx. 960,000 pixels
		DZ-MV730A: Video: Approx. 340,000 Photo: Approx. 340,000	DZ-MV550A: ←—

Item		DZ-GX20A/MV780A/MV730A	DZ-MV580A/MV550A
Lens		DZ-GX20A: F1.8 - 2.2 f = 3/16" - 1-3/4" (4.5 - 45 mm)	----------
		DZ-MV780A: F1.8 - 2.3 f = 1/8" - 1-1/4" (3.2 - 32 mm)	DZ-MV580A: F1.8 - 2.4 f = 3/16" - 1-1/2" (3.8 - 38 mm)
		DZ-MV730A: F1.6 - 2.3 f = 1/8" - 1-1/16" (2.7 - 43.2 mm)	DZ-MV550A: F1.8 - 2.8 f = 1/16" - 1-1/2" (2.1 - 37.8 mm)
Zoom		DZ-GX20A/MV780A: Optical 10×, 240× with digital zoom added (40× for photo)	DZ-MV580A: Optical 10×, 240× with digital zoom added (40× for photo)
		DZ-MV730A: Optical 16×, 240× with digital zoom added (40× for photo)	DZ-MV550A: Optical 18×, 500× with digital zoom added (40× for photo)
Filter diameter		DZ-GX20A/MV730A: 1-5/16" (34 mm) DZ-MV780A: 1-1/4" (30.5 mm)	1-7/16" (37 mm)
Required minimum illumination		1 lx (When Low Light mode is selected)	0.3 lx (When Low Light mode is selected)
Viewfinder		0.2-inch color (equivalent to approx. 200,000 pixels)	0.33-inch color TFT (approx. 110,000 pixels)
LCD monitor		2.5-inch color TFT (approx. 120,000 pixels)	←
Power consumption (DVD-RAM used, FINE mode)		DZ-GX20A: Approx. 4.4 W	----------
		DZ-MV780A: Approx. 3.8 W	DZ-MV580A: Approx. 4.4 W
		DZ-MV730A: Approx. 3.2 W	DZ-MV550A: Approx. 4.1 W
Weight		DZ-GX20A: Approx. 480 g	----------
		DZ-MV780A: Approx. 420 g	DZ-MV580A: Approx. 500 g
		DZ-MV730A: Approx. 450 g	DZ-MV550A: Approx. 490 g
Maximum time of recordable video (per side)	XTRA	Approx. 18 min/ Variable: Approx. 3 - 10 Mbps (When using DVD-RAM and DVD-R)	Approx. 18 min/ Variable: Approx. 3 - 10Mbps (When using DVD-RAM)
	FINE	Approx. 30 min/Fix: Approx. 6 Mbp	←
	STD	Approx. 60 min/Fix: Approx. 3 Mbps	←
	LPCM	----------	Approx. 60 min/Fix: Approx. 3 Mbps (When using DVD-R)
Number of pixels for video (MPEG2)	XTRA(*1)/FINE	704 × 480 pixels	←
	STD	352 × 480 pixels	←
	LPCM(*1)	----------	704 × 480 pixels
Audio recording format	XTRA(*1)/ FINE/STD	Dolby Digital	MPEG Audio layer 2
	LPCM(*1)		Linear PCM
Audio playback format		Dolby Digital, MPEG Audio layer 2, Linear PCM (LPCM)	Dolby Digital, MPEG Audio layer 2, Linear PCM (LPCM)

*1: With DZ-MV580A/550A, the XTRA mode can be set only when DVD-RAM is used; LPCM mode can be set only when DVD-R is used.

Item			DZ-GX20A/MV780A/MV730A	DZ-MV580A/MV550A
Maximum number of recordable photos	DVD-RAM (FINE/NORM/ ECO)		DZ-GX20A: Approx. 750 DZ-MV780A/MV730A: Approx. 999	Approx. 999
	Card (32MB)	FINE	DZ-GX20A: Approx. 29	Approx. 50
			DZ-MV780A: Approx. 58	
			DZ-MV730A: Approx. 232	
		NORM	DZ-GX20A: Approx. 38	Approx. 80
			DZ-MV780A: Approx. 76	
			DZ-MV730A: Approx. 464	
		ECO	DZ-GX20A: Approx. 58	Approx. 110
			DZ-MV780A: Approx. 116	
			DZ-MV730A: Approx. 928	
Number of pixels for JPEG photo during camera recording			DZ-GX20A: 1600 × 1200 pixels	----------
			DZ-MV780A: 1280 × 960 pixels	DZ-MV580A: ←
			DZ-MV730A: 640 × 480 pixels	DZ-MV550A: ←
Number of pixels for JPEG photo during line-input recording			640 × 480 pixels	←
Number of pixels for MPEG photo during camera/line-input recording			704 × 480 pixels	←
PHOTO button (exclusively for recording photos on card/disc)			Provided (with focus lock function)	Not provided (REC button for videos is used in common, without focus lock function)
Quick Menu button			Provided	Not provided (Quick mode slide switch)
Full auto button			Not provided	Provided
External video input function			DZ-GX20A/MV780A: Composipe & S	DZ-MV580A: ←
			DZ-MV730A: Composite only	DZ-MV550A: ←
EIS function			DZ-GX20A/MV780A: Video mode only	DZ-MV580A: ←
			DZ-MV730A: Video & Photo mode	DZ-MV550A: ←
Disc protect			Software disc-protect	
EVF brightness setting function			Provided	Not provided
EVF display on/off funtion			Provided	Not provided
Accessory Shoe			DZ-GX20A/MV780A: Power/Control terminal provided	DZ-MV580A: ←
			DZ-MV730A: Power/Control terminal not provided	DZ-MV550A: ←
PC connection terminal [USB standard]			Type mini-B [USB 2.0]	←
Marks of power switch			: Video : Disc photo CARD : Card photo	: Video : Disc photo CARD : Card photo
AC adapter/charger			DZ-ACS2	DZ-ACS1

Item	DZ-GX20A/MV780A/MV730A	DZ-MV580A/MV550A
Battery pack	DZ-GX20A provided: DZ-BP14S (7.2V/1360mA)	Provided: DZ-BP14S (7.2V/1360mA)
	DZ-MV780A/MV730A provided: DZ-PB7S(*2) (7.2V/680mA)	
	Optional: DZ-BP14SW (7.2V/1360mA)	←
Infrared remote control	DZ-RM4W (Battery: CR2032 × 1) [Not provided with DZ-MV730A]	DZ-RM3W (Battery: CR2025 × 1)
AV/S input/output cable	Pin 8 type (With S-video/Composite video/Audio-L/Audio-R)	←
Provided software	DVD-MovieAlbum DVDfunSTUDIO UDF driver (For Windows Me/2000 Professional/ XP home/XP Professional) [Not provided with DZ-MV730A]	DVD-MovieAlbum MyDVD UDF driver USB driver (For Windows 98/98 Secand Edition/ Me/2000 Professional/XP home/XP Professional)
Provided disc cleaning cloth	Provided	Not provided
Provided 8cm DVD-RAM/R	Single-side DVD-R [Not provided with DZ-MV730A]	Single-side DVD-RAM (In round DVD holder)

*2: Unavailable on DZ-GX20A

2-5 Compatibility of Recorded Discs

(1) DVD-RAM

A DVD-RAM recorded or edited on DZ-GX20A/MV780A/MV730A can also be recorded, edited and played (*1) on other Hitachi DVD video camera/recorders.
Similarly, A DVD-RAM recorded or edited on other Hitachi DVD video camera/recorders can be recorded, edited and played (*1) on DZ-GX20A/MV780A/MV730A.
However, scene memos recorded on the Disc Navigation function of DZ-MV100A cannot be played or edited on another model.

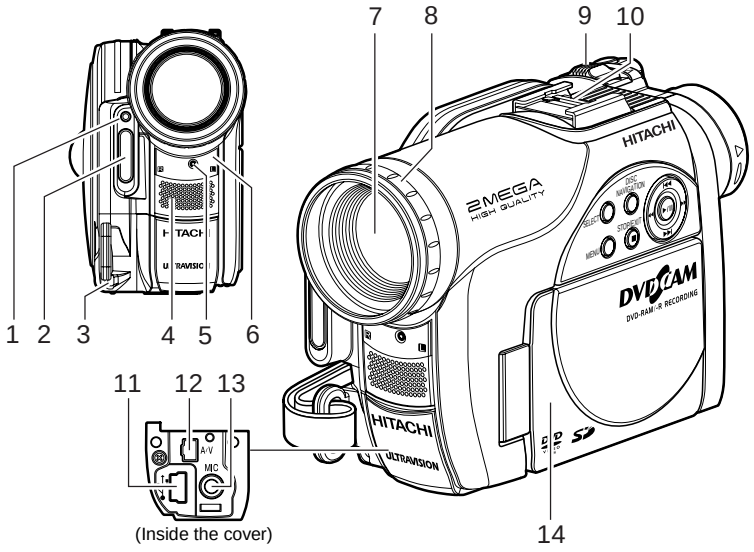
*1: If disc-protect is set, it must be released in order to record or edit on the disc. However, since the DZ-MV100A and DZ-MV200 series models use a different disc-protect method, the disc-protect set on other models cannot be released on them.

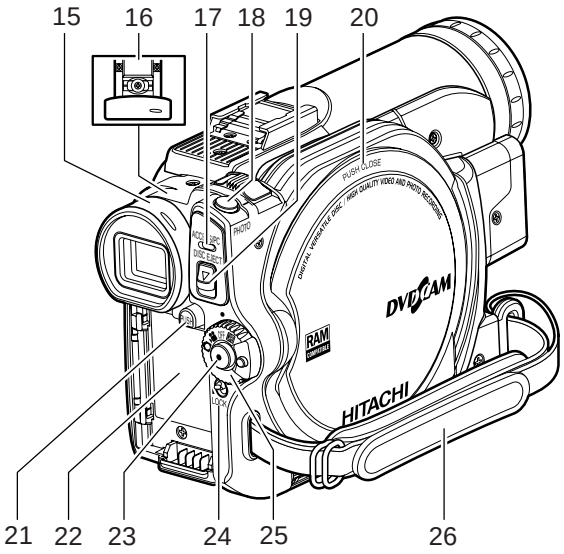
(2) DVD-R

A DVD-R recorded on DZ-GX20A/MV780A/MV730A can be played using other Hitachi DVD video camera/recorders (*2) even if it is not finalized.
However, do not use other Hitachi DVD video camera/recorders (*2) to record or finalize a DVD-R recorded on DZ-GX20A/MV780A/MV730A: Doing so will make the DVD-R unplayable on other DVD video camera/recorders, DVD players, etc.
A DVD-R recorded on other Hitachi DVD video camera/recorders (*2) can be played using DZ-GX20A/MV780A/MV730A even if it is not finalized (*3), but it cannot be recorded or finalized on DZ-GX20A/MV780A/MV730A.

*2: DZ-MV100A is excluded: It cannot handle DVD-R.
*3: Loading DVD-R will automatically start the the Disc Navigation function.

2-6 Names of Parts





Accessores

Battery (Model: DZ-BP14S) [For DZ-GX20A only]

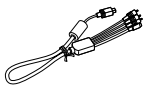
Battery (Model: DZ-BP7S) [For DZ-MV780A/ MV730A only]

AC adapter/ charger (Model: DZ-ACS2)

DC power cord

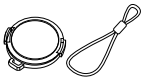
Power cable

AV/S Input/Output cable



Shoulder strap

Lens cap and lens cap string

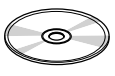


Infrared remote contorl (Model: DZ-RM4W) [For DZ-GX20A/ MV780A only]

Disc cleaning cloth

Single-sided 8 cm DVD-R [For DZ-GX20A/MV780A]

Software CD-ROM [For DZ-GX20A/ MV780A]



PC connection cable [For DZ-GX20A/MV780A]

Lithium battery (Model: CR2032) [For Infrared remote contorl of DZ-GX20A/MV780A]

WARNING:
Keep this battery away from children. If swallowed, consult a physician immediately for emergency treatment.

1 Light receiving sensor
(for DZ-GX20A only)
This sensor controls the amount of light to be emitted from the built-in flash. Take care not to block with hand, etc. during recording.

2 Flash (for DZ-GX20A only)

3 Lens cap string attachment hole

4 Stereo microphone

5 Recording indicator
The red indicator will light during recording.

6 Infrared receiver
When the remote control is used to operate the DVD video camera/recorder, this receiver will receive the infrared signal.

7 Optical 10x zoom lens
(for DZ-GX20A or DZ-MV780A only)
Optical 16x zoom lens
(for DZ-MV730A only)

8 Lens hood
Always remove this lens hood when using generally available tele-conversion or wide-conversion lens.

9 Zoom lever
Push the lever to the T side for telephoto, or to the W side for wide-angle.

10 Accessory shoe
For DZ-GX20A or DZ-MV780A only:
The optional video flash can be attached here. (See the instruction manual of device to be attached for details.)

11 PC connection terminal (TO PC)
[for DZ-GX20A or DZ-MV780A only]

12 AV input/output jack

13 External microphone jack

14 2.5" type liquid crystal display (inside)

15 Viewfinder

16 Diopter control
To adjust the focus of image appearing in the viewfinder. (Pull out the viewfinder.)

17 ACCESS/PC indicator
(for DZ-GX20A or DZ-MV780A only)
ACCESS indicator
(for DZ-MV730A only)
Will blink or light when the disc in DVD video camera/recorder is accessed (write or read is executed) or the DVD video camera/ recorder is connected to PC.

18 PHOTO button

19 DISC EJECT button
Press down and release this button to open the disc guide.

20 Disc insertion block

21 BATTERY EJECT button
Press this button when removing the battery.

22 Battery attachment platform

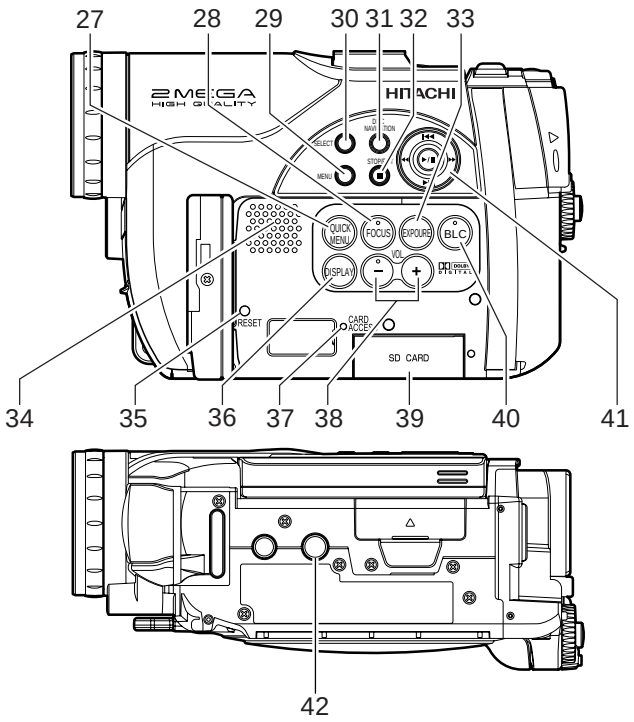
23 Record button (REC)

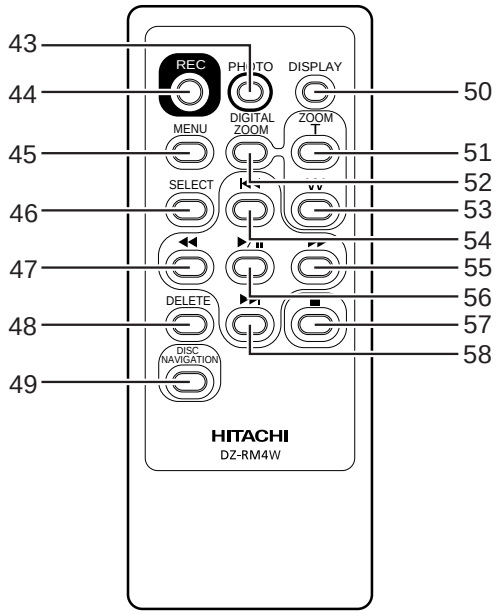
24 LOCK switch
It is recommended that you set the LOCK switch to LOCK (to the upper position) to prevent the power switch in the " " position from accidentally moving to " ".

25 Power switch

26 Hand strap

Although the external appearances of DZ-GX20A, DZ-MV780A and DZ-MV730A are different, the method of operating both models is identical.





27 QUICK MENU button
To display only the functions that you frequently use (simple menus).

28 FOCUS button
To switch between manual focus and auto-focus.

29 MENU button
Press this button to display the menu for setting camera functions and Disc Navigation.

30 SELECT button

31 DISC NAVIGATION button

32 Stop/cancel button
To end playback or cancel setting of menu.

33 EXPOSURE button
Press this button to adjust the exposure.

34 Speaker

35 RESET button
To reset all settings to defaults (status when the DVD video camera/recorder was shipped from the factory.)

36 DISPLAY (Screen display) button
Press this button to display the details of image being played back or camera setting status, or switch the display off.

37 CARD ACCESS indicator

38 Volume control buttons (VOL) / ⊖⊕ buttons
To adjust the volume of sound from speaker, etc.

39 Card insertion block

40 BLC (backlight compensation) button
Press this button when subject is being lighted from rear.

41 ⏮ / ⏭ / ◀◀ / ▶▶ / ▶/⏸ buttons
Use these buttons to select a scene or menu item, and then press the center (▶/⏸) to play back the scene, or designate an option from the menu.

42 Tripod threaded hole
Used to attach the DVD video camera/ recorder to a tripod.

43 PHOTO button

44 REC button

45 MENU button

46 SELECT button

47 Reverse search button

48 DELETE button

49 DISC NAVIGATION button

50 DISPLAY button

51 ZOOM T button

52 DIGITAL ZOOM button

53 ZOOM W button

54 Reverse skip button

55 Forward search button

56 Play/pause button

57 Stop button

58 Forward skip button

* The buttons on remote control will function the same as those on DVD video camera/recorder.

2-7 List of Abbreviations and Terms for DVD Video Camera/Recorders

Index	Abbreviation/Term	Explanation
A	AC3	See Dolby AC3.
C	CPRM	Content Protection for Recordable Media: Copyright protection function that is suitable for online distribution of music.
	CSP IC	Chip Scale Package IC or Chip Size Package IC: This IC was made compact by arranging pins under the package.
D	DCF	Design rule for Camera File system standard: This camera file system standard.
	Dolby AC3	Audio coding format developed by Dolby Laboratories in U.S, also simply referred as AC3 format: Supports 5-channel full-range sound and one channel for sub-woofer sound playback.
	Dolby Digital	See Dolby AC3.
	DPOF	Digital Print Order Format: DPOF allows user to record print information along with photos on storage media to facilitate printing of photos.
	DVD	Digital Versatile Disc. A huge amount of digital data for video (movie) and audio can be recorded on this disc, whose size is the same as CD.
	DVD-Audio	One type of DVD standard disc, on which high-quality audio can be recorded
	DVD-R	One type of DVD standard disc, to which writing once is possible (recordable type)
	DVD-RAM	One type of DVD standard disc, to which writing up to 100,000 times is possible
	DVD-ROM	One type of DVD standard disc, to which data for computer can be recorded
	DVD-RW	One type of DVD standard disc, to which writing up to 1000 times is possible
	DVD-Video	One type of DVD standard disc, on which high-quality video and audio can be recorded
	DVD Video Format	Video recording/playback standard that applies to DVD-Video, DVD-R and DVD-RW
	DVD Video Recording Format	Video recording/playback standard that applies to DVD-RAM and DVD-RW: This allows versatile editing functions, differing from the DVD Video Format.
	DVD-VR Format	See DVD Video Recording Format.
E	Exif	Exchangeable image file format. File format used for recording photos on digital cameras.
F	FireWire	See IEEE1394.
	FNR	Frame Noise Reducer: This function or circuit automatically recognizes noise that randomly occurs between frames and removes it.
I	IEEE1394	Also referred to as FireWire or i-LINK: Standard for serial interface that connects PC and peripheral devices
	Interlaced CCD	This CCD scans one image twice (scans roughly once and interpolates between first scanning lines the second time) and interlaces the images obtained by scanning twice to create a one-image signal.
	i-LINK	See IEEE1394.
J	JPEG	Joint Photographic Expert Group: International standard format for compressing still images
L	LCD	Liquid Crystal Display. LCD formats include STN and TFT.
L	LPCM	Linear Pulse Code Modulation. Also referred to as linear PCM. LPCM is a format that digitizes analog audio data during recording and converts it to analog data during playback.
M	MMC	See MultiMediaCard.
	MPEG	Motion Picture Experts Group: Standard related to compression of digital video and audio. MPEG2 is a higher standard of MPEG and is applied to video (movie) requiring higher quality.

Index	Abbreviation/Term	Explanation
M	MPEG Audio Layer 2	One of three audio compression standards (layers 1-3) defined by MPEG
	MultiMediaCard	Also referred to as MMC. Compact memory card, 32 mm long × 24 mm wide × 1.4 mm thick
	SCSI	Small Computer System Interface: A standard for connecting computer and peripheral devices. The number, First, Ultra, Wide, etc., prefixed or suffixed to SCSI indicates the data transfer rate and connector specifications.
S	SDMI	Secure Digital Music Initiative: This conference was established by hardware makers, the Recording Industry Association of America (RIAA) and music industry companies, to protect copyrights of musical compositions.
	SD Memory Card	Formally named Secure Digital Memory Card. This compact memory card, 32 mm long × 24 mm wide × 2.1 mm thick, is equipped with an advanced copyright protection function.
	SecureMMC	See Secure MultiMediaCard.
	Secure MultiMediaCard	Also referred to as SecureMMC. This compact memory card has multimedia card specifications, to which an advanced copyright protection function is added.
	Software disc-Protect	This function writes the protect information to DVD-RAM disc to prevent accidental erasure. Software Disc-Protect is included in DVD-RAM disc specifications defined by DVD Forum.
	STN LCD	Super-Twisted Nematic Liquid Crystal Display: This type of color LCD is inferior to TFT LCD in coloring, view angle, etc.
T	TFT LCD	Thin Film Transistor Liquid Crystal Display: This type of color LCD features clear display, high contrast, wide view angle, etc.
U	UDF	Universal Disc Format, which is a file format of recordable disc defined by OSTA. The revision 2.01 UDF is used on DVD video camera/recorder.
	USB	Universal Serial Bus: Standard of serial interface that connects PC and peripheral devices. Two versions - USB1.1 and USB2.0, with different data transfer rates - exist at present.
V	VBR	Stands for Variable Bit Rate: This format of coding audio and video varies the amount of data depending on the subject image.

3 Description of Operation

3-1 Description of Structure

(1) Differences in structure between DZ-GX20A/MV780A and DZ-MV730A

The following three structures are different:

1) L case, R case, front case and lens cover

As shown in Fig. 3-1-1, the external appearances of DZ-GX20A and DZ-MV730A are very similar, with only the DZ-MV780A being different: Only for DZ-MV780A, the shapes of L case, R case, front case and lens cover are different, and their assembly method is different, too.

2) Accessory shoe

The accessory shoe of DZ-GX20A/MV780A has a power/control terminal, but the accessory shoe of DZ-MV730A doesn't, and so the DZ-MV730A does not have an SHE-H/SHE-M circuit board.

3) Camera block

The size and shapes of the camera blocks on DZ-GX20A/MV780A and DZ-MV730A are different because of differences in CCD image sensor and lens unit.

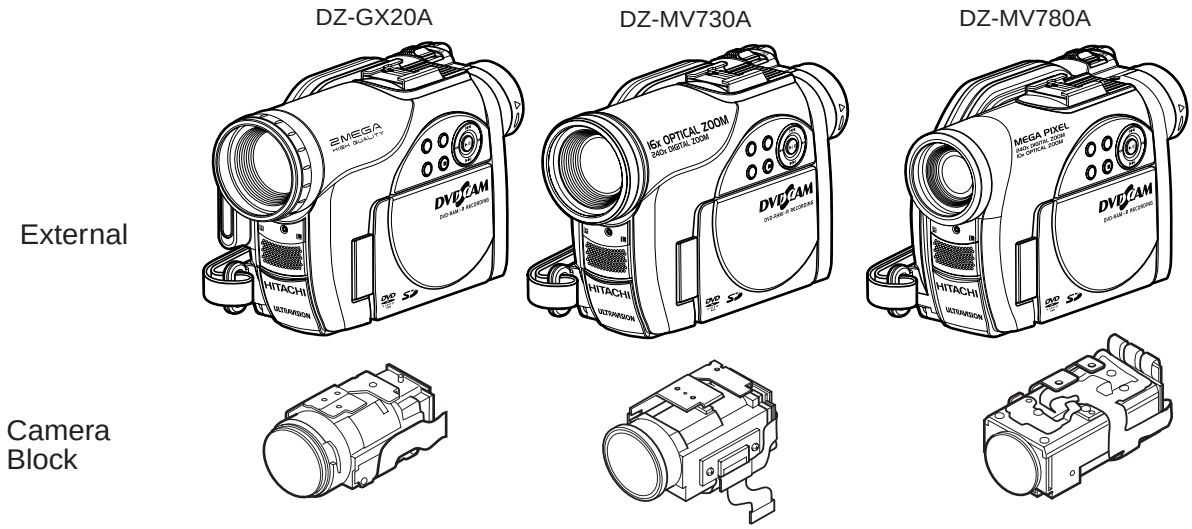


Fig. 3-1-1 Differences in Structure

(2) Configuration of circuit boards and their mounting locations

1) Comparison between DZ-GX20A, DZ-MV780A and DZ-MV730A

The configuration and locations of circuit boards in DZ-GX20A, DZ-MV780A and DZ-MV730A are identical, except for whether the SHE-H/SHE-M board is provided or not.

The SHE-H/SHE-M circuit board is used for the accessory shoe control terminal.

The DZ-MV730A does not use the SHE-H/SHE-M circuit board, because it does not have a control terminal for the accessory shoe.

2) Comparison between new models and DZ-MV580A

The new models are identical except for the following circuit boards:

GSL-H/GSL-M/GSL-L circuit board:

The CCD image sensor mounting board (SEN-H) and camera shake detection gyro mounting board (GYR-H), which were discrete in DZ-MV580A, have been integrated into one circuit board.

AVJ-H/AVJ-M circuit board:

The AV/S input/output, PC connection and external microphone terminals, which were mounted on separate boards in DZ-MV580A, have been integrated into one circuit board of front side.

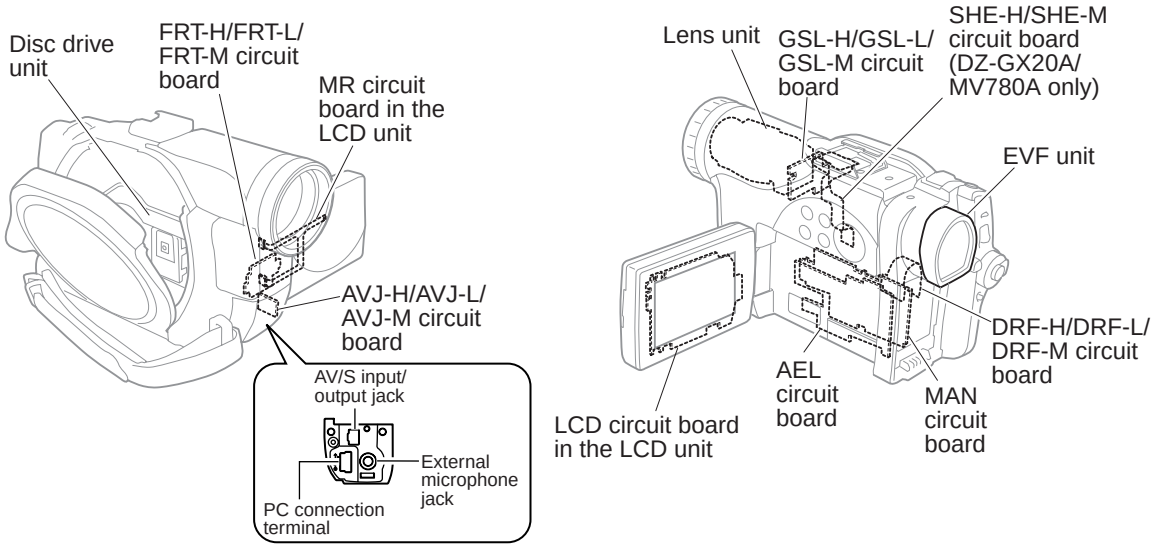


Fig. 3-1-2 Configuration of circuit boards and their mounting locations

3-2 Description of Newly Adapted Technology

(1) Assist Light

Specify “Program AE: Low Light”, open the LCD monitor 90°, and turn it 180°. The LCD monitor screen will glow white. This function is referred to as “Assist Light”.

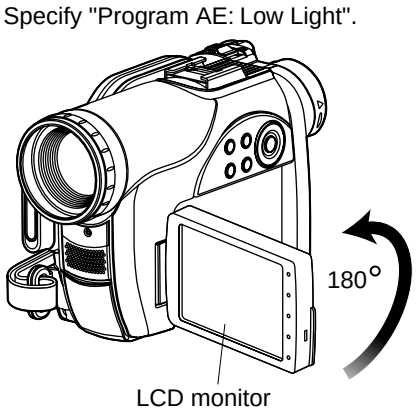


Fig. 3-2-1 Assist Light

(2) Quick start

“Quick start” refers to a function, in which if a disc is loaded, the disc will be temporarily recognized even when the power switch is set to “OFF”, and the recognized data will be held. With previous models, disc recognition did not start unless the power switch was set to “VIDEO” or “DISC PHOTO”. Therefore, it took approx. 16 seconds(*1) before recording started.

If a disc is inserted in advance, the “Quick start” function will allow user to start recording in approx. 7.5 seconds(*1).

*1: Average time: It may take much more time, depending on the status of disc.

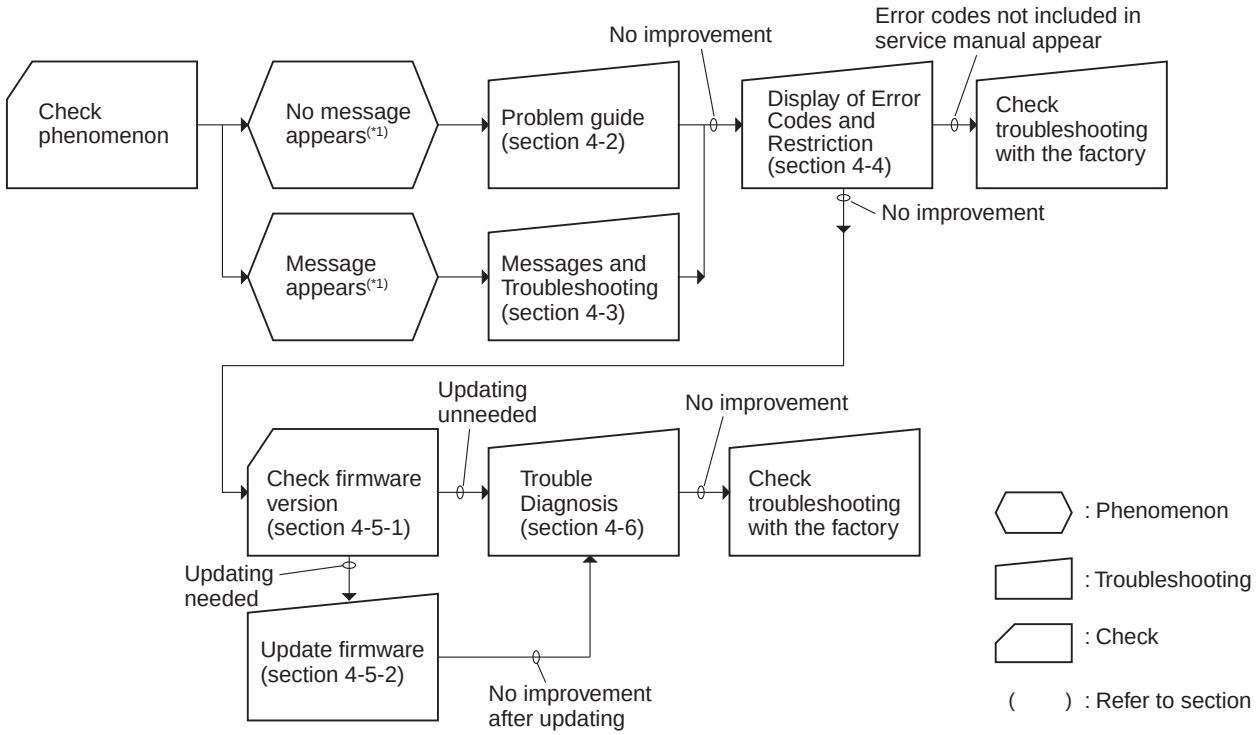
4 Troubleshooting

4-1 Procedure for Troubleshooting

Perform troubleshooting in the order shown in Fig. 4-1-1.

Note:

1) Before troubleshooting or servicing, be sure to obtain customer approval for the following:
   a) The recorded contents on disc may be lost depending on the details and situation of fault (defect).
   b) The date/time and various settings, including video recording mode, designated by customer after purchase, may be reset to the defaults before purchase (factory settings).
2) Perform "4-8-2 System reset procedure" after repair is completed: Note that system reset will erase all error codes that will be necessary for troubleshooting.
3) Take notes of settings on received product in the Remarks and Memo columns, referring to "Table 4-8-1 List of items to be reset": These notes will be necessary not only for reset, but for checking any defects that occur under the particular setting conditions.



*1: Messages and error codes will appear on LCD monitor or in viewfinder.

Fig. 4-1-1

4-2 Problem Guide

Check the following before judging that this DVD video camera/recorder is faulty.

Symptom	Cause and Correction
Power supplies	
Battery cannot be charged.	Is the DC power cord connected to AC adapter/charger? Unplug it. If the DC power cord is connected, the AC adapter/charger will not enter the charge status.
	Is the battery abnormally hot? Remove the battery from AC adapter/charger, leave it as is until it cools down, and then charge it again.
	Is the ambient temperature is too low or high? Always charge the battery at 10 - 30°C.
	Has the battery been unused for a long time? Remove the battery from AC adapter/charger, and then reattach it. If the battery is still not charged, it may be dead: Purchase a new one. * If the battery does not charge after you try the above four procedures, it may be dead: Purchase a new battery.
Battery weakens fast.	Are you using the DVD video camera/recorder where the temperature is low? A fully charged battery may be discharged sooner than usual at low temperatures. Keep extra batteries on hand.
	Battery may be dead: Replace with a new one. The performance of battery will deteriorate if it is used for an extended period of time or frequently.
The CHARGE indicator on AC adapter/charger is blinking.	The battery may be over-discharged. Continue charging: The CHARGE indicator will change to a steady light, and the battery will be charged normally.
	Is the ambient temperature is too low or high? Always charge the battery at 10 - 30°C.
Power turns off immediately after being turned on.	Is battery charged? Charge it.
When power is turned on, the LCD screen will turn on and off.	
Power goes off unexpectedly.	Is Power Save specified "On"? The specifications state that the powered DVD video camera/recorder automatically turns off if it is left for as long as 5 minutes without performing recording or playback, with "Power Save: On" specified. Set the power switch to "OFF", and then turn this DVD video camera/recorder on again. To stop automatic power off, specify "Power Save: Off".
Power cannot be turned off.	Remove the battery or AC adapter/charger. Then reconnect the battery or AC adapter/charger.
Even if the DVD video camera/recorder is off, opening the cover will cause the ACCESS indicator to brink.	This is normal and does not indicate a fault. The specifications state that the ACCESS/PC connection indicator will continue to blink when the disc insertion block is open, regardless of the position of the power switch. The indicator will automatically go out when the disc insertion block is closed.

Symptom	Cause and Correction
During recording	
Pressing the REC or PHOTO button will not start recording.	Is disc-protect engaged? Release the disc-protect.
	Is the erase prevention switch on SD memory card set to the lock position? Release the lock of erase prevention switch.
	Is input image copy-guarded? The specifications state that the DVD video camera/recorder cannot record a copy-guarded image.
Recording starts but stops immediately.	Is there any dirt, fingerprint or scratch on the disc? Refer to “4-4-4 Cleaning disc and optical pickup” and clean the disc. If no recovery is made, replace the disc.
	Is some other AV device directly connected to the AV input/output jack of the DVD video camera/recorder? If the AV device is connected via several other devices, such as AV selector, the video signal may not be transmitted correctly. In such a case, reduce the number of devices through which the video signal is transmitted, or connect AV device directly.
	Are you attempting to record image from video game or PC? Depending on video game or PC, image cannot be recorded on the DVD video camera/recorder.
LCD screen is hard to see.	Has brightness of LCD screen been adjusted? Stop recording and adjust the brightness.
	Is the DVD video camera/recorder being used outdoors? Use the viewfinder. When using LCD monitor, adjust angle so that LCD screen is not exposed to direct sunlight.
Unevenness appears on LCD monitor screen	Did you press the LCD monitor or the area around it? If the LCD monitor is pressed, some unevenness will occur. Release your hand and leave the LCD monitor for a while: Normal display will be restored.
Black dots or red, blue or green dots always lit appear on LCD screen or in Viewfinder.	The panels used for LCD monitor and viewfinder of the DVD video camera/ recorder are produced using highly precise technology. However, 0.01% or less of total pixels may not light (black dots) or may remain lit (red, blue, green dots). (The effective amount of pixels on LCD panel is 99.99% or more.) This shows the limitations of the current technology, and does not indicate a fault that will interfere with the operation of LCD panel or operation of the DVD video camera/ recorder.
Focus is not correct.	Is it difficult to use auto-focus with the subject? Focus manually.
	Does "MF" appear? The DVD video camera/recorder is set to manual focus. Focus the subject manually, or release manual focus.
	Is the diopter control of viewfinder correctly adjusted? Adjust the diopter control.
	In cases other than the above, set the power switch to "OFF", and then reset it to a position other then “OFF”.

Symptom	Cause and Correction
During playback	
Recognition of disc is not complete.	Is there any dirt, fingerprint or scratch on the disc? Refer to “4-4-4 Cleaning disc and optical pickup” and clean the disc.
Pressing the playback button will not start playback.	Was the image recorded on a device other than this DVD video camera/recorder? Playback of image recorded on devices other than this DVD video camera/ recorder may be impossible.
	Has scene been edited on a device other than this DVD video camera/recorder? If a scene that was recorded on this DVD video camera/recorder is edited on a device other than this DVD video camera/recorder, playback may not be possible on this DVD video camera/recorder.
No playback image appears on TV screen.	Is the DVD video camera/recorder connected to TV correctly? Check the connections.
	Is TV input selector set correctly? If the TV has multiple video input jacks, check to see whether the correct input jack was selected. If the DVD video camera/recorder is connected to VCR, set the input selector of VCR to "external input (LINE)".
Playback picture is momentarily interrupted.	Is there any dirt, fingerprint or scratch on the disc? Refer to “4-4-4 Cleaning disc and optical pickup” and clean the disc.
Poor playback picture.	Was the image input from analog VCR (VHS, 8 mm) and recorded? The problem may be improved if a VCR equipped with TBC (time base corrector) circuit is used for playback.
Playback picture is greatly distorted.	Was recording of external input made with "Frame" specified? Specify "Field" for "PHOTO Input" in record mode settings.
No sound.	Is the TV volume control set correctly? Adjust volume control on TV.
Disc Navigation thumbnails do not appear.	Did the image recorded from AV input/output jack have noise or disturbance? Re-record image with no noise or disturbance.
Photos on card cannot be played back.	Is a photo recorded on devices other than this DVD video camera/recorder being played back? The specifications of this DVD video camera/recorder allow it to play back photos that are recorded conforming to DCF standard and have 80-4000 horizontal pixels x 60-3000 vertical pixels. Make sure that the photo to be played back satisfies these specifications. Note that even photos that satisfy the specifications may not be playable, depending on the recording status. The thumbnail of any photo that cannot be played back will appear in single blue.
It will take some time to play back photos on card.	Is a photo with a large number of pixels being played back? It will take some time to play back a photo with a large number of pixels.
When connected to PC (when using provided software)	
No drive icon appears on PC.	Is the DVD video camera/recorder turned on? Connect the AC adapter/charger and set the power switch to a position other than "POWER OFF".
	Is PC connection cable properly plugged in? Plug the PC connection cable connector completely into the DVD video camera/ recorder.
	Turn PC off and unplug the PC connection cable: Then restart PC and use the PC connection cable to connect the DVD video camera/recorder and PC.

Symptom	Cause and Correction
Application is not normally run on PC.	Turn the PC and the DVD video camera/recorder off, and try again.
DISC EJECT button does not work when the DVD video camera/recorder is connected to PC.	The DISC EJECT button is invalid while the DVD video camera/recorder is connected to PC. Start Windows Explorer, right-click the drive icon corresponding to the DVD video camera/recorder, and then click "Eject". Once DVD-MovieAlbumSE has started, click the Eject button on the DVD-MovieAlbumSE screen.
When the time stamp of file on DVD-RAM disc is viewed on PC, it is different from the actual recording date/ time.	Since the file system of this DVD video camera/recorder is operated on Greenwich Mean Time (GMT), the time stamp will be GMT. However, since the time lag information is recorded on disc, the date/time display on playback screen of this DVD video camera/recorder will be the actual recording date/time.
Error occurs in playback of the DVD video camera/ recorder on PC	If error occurs with USB connection, the transfer rate is not sufficient. It is recommended that you use a USB terminal conforming to USB2.0 when connecting the DVD video camera/recorder.
Error occurs during writing to disc.	The temperature of the DVD video camera/recorder is too high due to continuous operation. Disconnect the DVD video camera/recorder from PC, remove the disc from the DVD video camera/recorder, set the power switch to "OFF", and then leave it as is until the temperature decreases. After checking that the temperature has gone down, use a brand-new disc and restart operation.
Transfer of images stops.	The USB terminal of PC may be faulty. Connect the DVD video camera/recorder to another USB terminal of PC. If your PC is desktop type, it is recommended that you use USB terminal on the back of PC. If you are using USB2.0 extended card, it is also recommended that you install the newest version driver provided each USB2.0 card maker.
DVD-RAM/R/RW drive built into PC cannot be used after the provided software has been installed.	This problem may be solved if the software related to DVD-RAM/R/RW built into PC is upgraded, or if the UDF driver is uninstalled. However, if the OS of PC is Windows Me/2000 Professional, uninstalling the UDF driver will make it impossible for the photos recorded on DVD-RAM disc in the DVD video camera/ recorder to be read by the PC.
Video is not recognized by software in PC.	Is the power switch of the DVD video camera/recorder set to "VIDEO" or “PHOTO (disc)”? Set it to “VIDEO” or “DISC PHOTO”.
DVD-R disc cannot be played back on DVD-MovieAlbumSE	DVD-MovieAlbumSE is exclusively for DVD-RAM disc. When playing back DVD-R disc on PC, use generally available DVD-R disc playback software.
Error appears when starting DVD-MovieAlbumSE	Make sure that your PC display adapter (video card) conforms to DirectX8.1
When DVD -MovieAlbumSE software provided with the DVD video camera/recorder is started, "Disc in Drive X: cannot be used on MovieAlbum" appears (a letter showing the drive where disc is loaded appears in X).	Is a disc other than DVD-RAM loaded? Load a DVD-RAM disc. DVD-MovieAlbumSE is exclusively for DVD-RAM disc. Use the following procedure to select the drive where DVD-RAM disc is loaded. 1) Click the "Preference" button in the dialog box. 2) Click "Preference". 3) Click "Device Setting". 4) Choose the drive where DVD-RAM disc is loaded in the "Drive Select" column, and then click "OK".

Symptom	Cause and Correction
An image that should have been recorded does not appear when DVD-MovieAlbumSE is started.	Use the following procedure to select the drive where DVD-RAM disc is loaded. 1) Click the "Preference" button at the top right of DVD-MovieAlbumSE screen. 2) Click "Preference". 3) Click "Device Setting". 4) Choose the drive where DVD-RAM disc is loaded in the "Drive Select" column, and then click "OK".
Executing “Export” on DVD-MovieAlbumSE will interrupt reading midway	Do not choose “Simple Export”: If you do, reading will stop midway.
When executing “Export” on DVD-MovieAlbumSE, it will take time to read	a) If photo is included in the range of “export”, it may take more time because data must be re-encoded and read. b) If “Divide by Maker” is not chosen, it may take some time because data will be read while being re-encoded.
"Hardware Removal" results in error	Making sure the ACCESS/PC indicator on the DVD video camera/recorder goes out, turn the PC off, and then unplug the PC connection cable from the DVD video camera/recorder. If your PC uses Windows 2000 Professional, the problem may be solved it you install Windows 2000 Service Pack 3 or later.
No USB HS (high speed) connection even when USB2.0 card is used	Make sure that you have already installed the driver provided with the USB2.0 card. You will need to install the driver provided by USB2.0 card maker in order to operate the USB2.0 card at HS (high speed).
Miscellaneous	
Recognition of disc does not start.	Is the disc properly attached to the turntable? Attach the disc to the turntable properly.
	Is the disc insertion block closed? Securely close the disc insertion block.
	If the disc is not recognized even when the disc has been properly attached to the turntable and the disc insertion block has been securely closed, the DVD video camera/recorder may be faulty: Refer to “4-6 Trouble Diagnosis”.
Power does not come on, or no operation occurs by pressing button.	Remove the battery or AC adapter/charger, reattach it, and then check to see whether operation is accepted.
The date and time are incorrect.	Has the DVD video camera/recorder been left unused for a long period of time? The internal backup battery may be discharged: Charge it. (Charge procedure: Connect the AC adapter/charger to the DVD video camera/recorder and AC outlet, set the power switch on the DVD video camera/recorder to "OFF", and then leave them for at least 24 hours.)
No scene can be deleted.	Is the cursor placed on scene to be deleted? Even if desired scenes are selected using yellow cursor, if there are the selected scenes (in red frame), those scenes in red frame will be deleted. Check the color of cursor and bar graph on the thumbnail display screen.

Symptom	Cause and Correction
Disc cannot be removed. (Disc insertion block does not open)	Is battery or AC adapter/charger (power supply) connected? With the DVD video camera/recorder, a disc cannot be removed unless a power supply is connected.
	Has disc rotation stopped? Making sure the disc stops, and then restart operation. Disc cannot be removed until rotation has stopped.
	Was the battery or AC adapter/charger (power supply) removed before setting the power switch to "OFF"? Reconnect the power supply, change the power switch several times, set it to "OFF", and then press the DISC EJECT button.
	If the disc insertion block still does not open with the above procedure, the DVD video camera/recorder may be faulty: Remove the disc, referring to "4-7 Procedure for Removing Disc from Faulty DVD Video Camera/Recorder", and then refer to "4-6 Trouble Diagnosis".
The DVD video camera/ recorder cannot be operated from remote control.	Is the remote control pointed at the infrared receiver on the DVD video camera/ recorder? Point it at the infrared receiver on the DVD video camera/recorder.
	Is the infrared receiver on the DVD video camera/recorder exposed to direct sunlight or strong fluorescent light? The remote control cannot operate the DVD video camera/recorder when strong light strikes the infrared receiver. Adjust the position or angle of the DVD video camera/recorder.
	Is there a battery in the remote control? Also check the polarities of battery. Replace the battery if necessary.
	Is the DVD video camera/recorder powered? Turn it on.
Disc cover cannot be closed.	Is the disc loaded properly? Remove the disc and then reload it. A disc in the DVD round holder, square cartridge or caddy cannot be used as is: Remove the disc from the package, and then load the bare disc.
	Is a battery or AC adapter/charger (power supply) connected? Connect a battery or AC adapter/charger.
Operating sound is heard cyclically.	This sound is heard because the disc is cyclically operated; it does not indicate a fault.
The DVD video camera/ recorder vibrates.	This does not indicate a fault. These vibrations or sound are generated when the disc drive unit is operating.
Slight sound is heard from the DVD video camera/ recorder.	

4-3 Messages and Troubleshooting

Some messages may appear on the LCD screen or in the viewfinder during operation. If a message appears, check the following, and then perform the appropriate action, according to the message content:

1) Is the disc bottom/surface reversed when using a single-sided disc?
   If so, reload the disc properly.
2) Is there any condensation on the lens or in the disc drive unit of DVD video camera/recorder?
   Condensation will occur when the DVD video camera/recorder is moved from a cold place to a warm place, e.g. If condensation occurs, set the power switch to "OFF" with the disc loaded, and then leave the DVD video camera/recorder in a dry place until condensation disappears (for 1-2 or more hours).

The messages divided using broken lines in the table can be displayed in sequence from the upper row by pressing the ▶/II button.

Message	Cause/condition for message to appear	Troubleshooting
Battery is almost empty. Replace it.	Appears if the battery is discharged.	Replace with a charged battery, or use the AC adapter/charger.
Cannot combine scene.	Appears if an attempt is made to combine unconnected scenes: The specifications state that combining of only multiple scenes is possible.	Stop trying to combine scenes, or create a play list containing the scenes to be combined, and combine them on the play list.
Cannot combine scene of multiple programs.	Appears when combining the scenes in different programs was attempted.	When combining those scenes, first create a play list, and then combine the scenes on it.
Cannot combine. Deselect PHOTO scenes.	Appears if an attempt is made to combine scenes when a photo was selected: The specification state that combining of only video scenes is possible.	Select only video scenes, or stop trying to combine scenes.
Cannot combine. Select multiple scenes.	Appears when combining one scene was attempted.	Select multiple scenes and then combine them.
Cannot delete scenes.	Appears when user performed deletion at the upper limit of 999 scenes registered.(*1)	Combine divided scenes, and then delete if necessary.(*2)
Cannot execute. Unselect multiple scenes.	Appears if an attempt is made to select multiple scenes for division: The specifications state that dividing multiple scenes is impossible.	Divide scenes one by one.

*1: The DVD video recording format defines the maximum number of entry points as 999: Since one entry point is allocated to one scene, the maximum number of scenes recordable on disc with the DVD video camera/recorder is 999.

*2: If recording is continued without editing, one scene will comprise one cell for each entry point.
When scenes are combined, only the number of entry points will decrease (only the entry point is deleted); the number of cells will not decrease. Assume, for example, that the number of cells before scenes are combined is 999, which is the upper limit defined by the DVD video recording format. If a scene comprising one cell is divided at two points and the scene between the divided scenes needs to be deleted, the cell must be further divided in order to delete. However, since the number of cells has reached the upper limit in this case, the cell cannot be divided and the scene cannot be deleted.

Message	Cause/condition for message to appear	Troubleshooting
Cannot execute. Change display category to All.	Appears when combining or moving scenes was instructed with “Category: VIDEO or PHOTO” specified.	Specify “Category: All”, and then operate the DVD video camera/ recorder again.
Cannot read disc. Check dirt/crack/bothside contrary/inserted correctly.	Appears when reading or writing any recorded files cannot be done due to dirt on disc.	Refer to “4-4-4 Cleaning disc and optical pickup” and clean the disc. Or replace the disc.
	Appears when a warped or distorted disc, or a logically damaged disc, whose initialization was previously interrupted, is loaded.	Replace the disc.
CANNOT RECORD PHOTOS.	Appears if an attempt is made to record photos on DVD-R: The specifications state that no photo is recordable on DVD-R.	Use a DVD-RAM or card when recording photos.
Cannot replace thumbnail on PHOTO scenes.	Appears when a photo thumbnail was selected for change in scene editing menu: The specifications stipulate that the thumbnail of photo cannot be changed.	Select a video to change the thumbnail.
Cannot select any more scenes	Appears when the number of scenes selected on card has exceeded the upper limit of 999 scenes.	Release the selection of unnecessary scenes.
CARD ALMOST FULL	Appears when the remaining number of recordable photos has reached less than 10 during recording.	Prepare another card, or delete unnecessary photos.
Card error has occurred. Format the card now?	Appears when a card initialized on PC, etc., or a card whose initialization was interrupted before, is loaded.	Choose “YES” and designate it to initialize the card (deleting all recorded data).
Card error has occurred. Formatting is not complete.	Appears when a damaged card is initialized.	Replace the card.
Card error has occurred. Keep card inside & restart.	Appears when an error occurred during editing of video files.	Set the power switch to “ OFF”, and after several seconds, set it to “CARD PHOTO”.
Card error.	Appears when the card cannot be recognized because its terminals are dirty.	Use a dry cloth to clean the card terminals.
	Also appears when data other than photos is recorded on card.	Replace the card.
Card full.	Appears when the recording capacity of card has reached the limit during recording.	Replace the card, or delete unnecessary photos .
	Appears when a card whose remaining recording capacity is small, and on which no photo can be recorded, is loaded.	Replace the card, or delete unnecessary photos.
Card full. Cannot execute.	Appears when the remaining capacity of card has reached the recordable limit.	Replace the card, or delete unnecessary photos.

Message	Cause/condition for message to appear	Troubleshooting
Card has no data	Appears when playback or editing was attempted using the Disc Navigation function with no scene recorded on the card.	Perform appropriate operation after the message disappears.
Card is not formatted. Format the card now. YES NO	Appears when an unformatted card or a card formatted on PC was loaded.	Choose “YES” and designate it when formatting card (deleting all recorded data).
Control Information Error.	Also appears when reading or writing from/to recorded file cannot be performed because the disc is dirty.	Refer to “4-4-4 Cleaning disc and optical pickup” and clean the disc. Or replace the disc.
	Appears when mismatch between recorded scene and scene information occurs. Such a mismatch occurs when editing is performed near the limit of disc storage capacity, or when the control information file is operated using a device other than the DZ-GX20A/ MV780A/MV730A.	Update the control information. (Start Disc Navigation, press the MENU button, and then execute “Update Control Info.” in the “Disc” menu.
COPY PROTECT	Appears if an attempt is made to record copy-guarded image. The specifications state that copy-guarded image cannot be recorded on the DVD video camera/ recorder.	Stop trying to record.
Data error in a part of image file. Repair data now? YES NO	Appears when reading/writing of recorded files cannot be performed because the disc is dirty. If the message appears immediately after recognition of a loaded, recorded disc was finished, first check for dirt on disc	Refer to “4-4-4 Cleaning disc and optical pickup” and clean the disc. Or replace the disc.
	Appears if writing to file cannot be completed normally because power was turned off by mistake during video recording or editing, and an abnormality in part of the file is recognized.	Choose “YES” and designate partial repair (automatic repair) of video file. Choosing “NO” will display a message for verifying initialization. [Refer to *3 page 4-11]
Data error in all image file. Repair all data now? YES NO	Appears when reading/writing of recorded files cannot be performed because the disc is dirty. If the message appears immediately after recognition of a loaded, recorded disc was finished, first check for dirt on disc	Refer to “4-4-4 Cleaning disc and optical pickup” and clean the disc. Or replace the disc.
	Appears if writing to file cannot be completed normally because power was turned off by mistake during video recording or editing, and it is recognized that the video file must be totally repaired.	Choose “YES” and designate total repair (automatic repair) of video file. Choosing “NO” will display a message for verifying initialization. [Refer to *3 page 4-11]

Message	Cause/condition for message to appear	Troubleshooting
DISC ACCESS	This message appears during normal operation process, when the DVD video camera/recorder checks whether a proper disc has been loaded or not. It is displayed for a longer time period when the date has changed.	Operate the DVD video camera/ recorder after the message disappears.
	This message appears during normal operation process, when the recorded images are being stored on disc.	Operate the DVD video camera/ recorder after the message disappears.
DISC ALMOST FULL	Appears when the remaining space on disc contains no more than one-minute video or 10 photos.	Delete unnecessary scenes, or replace the disc.
Disc error	Also appears when reading or writing from/to recorded file cannot be performed because the disc is dirty.	Refer to "4-4-4 Cleaning disc and optical pickup" and clean the disc. Or replace the disc.
	Appears when the disc has been edited on a device other than the DVD video camera/recorder, and mismatch has occurred in recorded data.	Format the disc (deleting all recorded data), or replace the disc.

*3: Take care with the following when repairing video file:

a) If any message appears when the power switch was moved from "OFF" to "Video" or "Disc Photo" with the disc left loaded after camera recording, choose repair.
b) If recording and playback are possible with another disc, which is free from condensation or dirt, choose repair.
c) Be sure to connect the AC adapter/charger: The specifications state that repair is possible only when the AC adapter/charger is connected.
d) Although repair is normally finished in several minutes, it could take approx. one hour.
e) If the disc is removed while it is being recognized, the repair function of video file will be invalid.
f) If the timing when power is turned off is inappropriate, normal repair may be impossible.
g) If the disc contains data recorded on a device other than DZ-GX20A/MV780A/MV730A, normal repair may not be possible.
h) The repaired data may be different from the original recorded content because of partial deletion of a defective portion.
i) The repaired data (only corrected portion in case of partial repair) will lose the original date/time information because the information for date/time when repair was executed will be added.
j) If "all repair" is executed, repair will be made in the order of all videos and all photos, and the time-sequential relationship of recorded contents may be lost.

Message	Cause/condition for message to appear	Troubleshooting
Disc error has occurred. Finalizing is not complete.	Appears when the disc could not be finalized because it was dirty.	Refer to “4-4-4 Cleaning disc and optical pickup” and clean the disc. Or replace the disc.
	Appears if accident, such as power off, has occurred during finalizing.	Set the power switch to “ OFF” and reconnect the AC adapter/charger; then set the power switch to “VIDEO” and start finalizing again. Or press the DISC EJECT button, reload the disc, and then execute finalizing.
	If the message still appears even when the disc has been cleaned and finalized again and again, the disc may be defective.	Replace the disc.
Disc error has occurred. Format the disc now? YES NO	Appears when reading or writing from/to recorded file cannot be performed because the disc is dirty.	Refer to “4-4-4 Cleaning disc and optical pickup” and clean the disc. Or replace the disc.
	Appears when a DVD-RAM initialized on PC, etc., or a card whose initialization was suspended before, is loaded.	Choose “YES” and designate it to initialize the DVD-RAM (deleting all recorded data).
Disc error has occurred. Formatting is not complete.	Appears when the disc could not be normally formatted because it was dirty.	Refer to “4-4-4 Cleaning disc and optical pickup” and clean the disc. Or replace the disc.
	Also appears when a warped or distorted disc was loaded, or a logically damaged disc whose formatting was suspended is loaded.	Replace the disc.
Disc error has occurred. Keep disc inside & restart.	Appears if a problem has occurred during editing of video file.	Exit the Disc Navigation function and set the power switch to “OFF” with the disc loaded; then reconnect the AC adapter/charger and set the power switch to “VIDEO” or “DISC PHOTO”. (The DVD video camera/ recorder will automatically repair the video file.)
Disc full. Cannot execute.	Appears if the recording capacity of disc has reached the limit during editing of video file.	Delete unnecessary scenes, or replace the disc.
Disc has no data.	Appears when playback or editing is attempted using the Disc Navigation function with no scene recorded on disc.	Operate the DVD video camera/ recorder after the message disappears.
Disc has no Play List.	Appears if switching of play list is selected with no play list registered.	Operate the DVD video camera/ recorder after the message disappears.

Message	Cause/condition for message to appear	Troubleshooting
Disc includes protected scenes. Delete scenes? YES NO	Appears if the loaded disc has a program (scene) that is write-protected by the software write-protect function, which is effective in program units. Although the DVD video camera/recorder is equipped with a software disc-protect function that is effective for disc units, it does not comply with software write-protect for program units. (The DVD Forum defines two types of software protect for DVD-RAM: disc units and program units.)	Release the write-protect using the device that has the software write-protect function for program units, or choose "YES" and designate it to delete the scenes.
	Appears when the card contains a scene write-protected by a device other than this DVD video camera/recorder.	Release the write-protect using the device which set it. Or choose "YES" and delete the scene.
Disc is full. Cannot add control info.	Appears if the number of scenes on play list exceeds the upper limit (999) while control information is being added. [Refer to *1 page 4-8]	Delete any unnecessary scenes, or combine several scenes, and then operate the DVD video camera/ recorder.
Disc is not formatted. Format the disc now? YES NO	Appears when reading or writing from/to recorded file cannot be performed because the disc is dirty.	Refer to "4-4-4 Cleaning disc and optical pickup" and clean the disc. Or replace the disc.
	Appears when an unformatted DVD-RAM or one initialized (other UDF2.0) on PC is loaded.	When initializing it (deleting all recorded data), choose "YES" and designate it.
	Also appears if user rejects partial repair or total repair of video file.	Choose "NO" and designate partial repair or total repair. When initializing it (deleting all recorded data), choose "YES" and designate it.
Disc is not formatted. If it formats, it becomes possible to use for camera. However, when you record from PC connection terminal, please do not format. Format the disc now? YES NO	Appears when a brand-new DVD-R was loaded.	When recording on the DVD video camera/recorder, choose "YES" and designate it. When recording video edited on PC connected via the PC connection terminal, choose "NO" and designate it.(*4)

*4: The purpose of formatting DVD-R on the DVD video camera/recorder is to write to disc a program exclusively for camera recording that is necessary to record images shot by camera in real time (increasing the response from disc). When recording images that were edited using PC on DVD-R via the PC connection terminal, do not format the disc: The program used exclusively for camera recording will disable normal recording.

Message	Cause/condition for message to appear	Troubleshooting
Disc overheat. Please retry later.	Appears when the temperature inside the DVD video camera/recorder, or the temperature of disc, is too high, and normal operation cannot be executed.	Set the power switch to "OFF" with the disc loaded, and then leave the DVD video camera/recorder in a well-ventilated place until the inside temperature decreases.
DVD-R Disc, 16:9 mode cannot be changed when Video mode is STD	Appears when the wide-screen mode was chosen with the video quality set to STD using a DVD-R: The combination of STD (352 × 480 pixels) and wide-mode is prohibited by the DVD video format.	Change the video quality to XTRA or FINE when using a brand-new DVD-R. If the DVD-R has already been recorded in STD mode, replace it.
DVD-R Disc, Input Source cannot be changed.	Appears when an attempt was made to switch the input with a DVD-R recorded in wide mode: Only the 4:3 aspect screen is possible for external input. This is because the DVD video format prohibits the mixing of 16:9 and 4:3 aspect screens.	Stop trying to switch the input, or replace the disc.
DVD-R Disc , Video mode, 16:9 mode cannot be changed.	Appears when an attempt was made to change the video quality or wide mode of recorded DVD-R. This is because, if even one scene is recorded after a disc is formatted, the specifications state that the video quality or wide mode used for the first recording will be held on the DVD-R.	Stop trying to change the video quality or wide mode, or replace the disc.
END OF DISC	Appears if the disc recordable capacity has reached the limit during recording.	Replace the disc.
End scene cannot be divided.	Appears when the last image of scene was selected to divide the scene: The specifications state that dividing a scene at its end is not possible.	Stop trying to divide a scene.
Error occurred. Please replace disc or format disc	Also appears when reading or writing from/to recorded file cannot be performed because the disc is dirty.	Refer to "4-4-4 Cleaning disc and optical pickup" and clean the disc. Or replace the disc.
	Appears if repair has failed with DVD-RAM after message "Data error in all image file. Repair all data now?" or "Found error in image file. Repair data now?" appeared.	Initialize the disc (deleting all recorded data), or replace the disc.
Error occurred. Please replace disc.	Appears if repair has failed with DVD-R after message "Data error in all image file. Repair all data now?" or "Found error in image file. Repair data now?" appeared.	Replace the disc.
Finalize may not be complete. Finalize again now? YES NO	Appears if accident, such as power off, occurred during finalizing, and then power was turned on again or disc was reloaded.	Choose "YES" and designate it to finalize the disc.

Message	Cause/condition for message to appear	Troubleshooting
Found error in image file. Repair disc now? YES NO	Appears if repair has failed after message “Data error in a part of image file. Repair disc now?” appeared.	Choose “YES” and designate total repair (automatic repair) of video file. Choosing “NO” will display a message for verifying initialization. [Refer to *3 on page 4-11]
It is unrecordable on this card.	Appears when a card other than SD memory card was loaded.	Insert an SD memory card.
JPEG file related to scenes are not found.	Appears when an attempt is made to copy photos on disc to card, when photo (JPEG) file to be copied is not stored on disc. When the DVD video camera/ recorder records a photo on disc, two photo files will be stored on disc - a photo (conforming to DVD video recording format) file to be displayed on the DVD video camera/recorder, and a photo (JPEG) file for storage that is linked to the photo for display. This message will appear when only the photo file for storage has been deleted on PC, etc.	Copy photos to card via PC. The photo (JPEG) file for storage is stored in DCIM\100HPNX1 folder. Stop trying to stop copy when a file is being deleted. If the file name was changed, use the PC to restore the original file name, or copy the file via the PC.
No card	Appears when no card is loaded.	Insert a card.
No card. Please insert card.	Appears when recording photos on card was attempted with no card loaded.	Insert a card.
NO DISC	Appears if no disc is loaded.	Load a disc
	Appears when a disc that cannot be used on the DVD video camera/recorder has been loaded.	Check the type of disc, and load a disc that can be used on this DVD video camera/recorder.
	Appears when the disc was not properly attached to the turntable.	Attach the disc properly.
	If any of the above does not apply, the DVD video camera/recorder may be faulty.	Refer to “4-6 Trouble Diagnosis ”.
No more scenes. Play List was deleted.	Appears during user operation; all recorded scenes have been deleted and cleared. The specifications stipulate that a play list with no scene on it cannot be held: If all registered scenes have been deleted, the play list will also be deleted.	Operate the DVD video camera/ recorder after the message disappears.
Photo cannot be divied	Appears when scene division was attempted after a photo was selected: The specifications state that no photo can be divided.	Select a video and divide it.
Play Lists over limit.	Appears if an attempt is made to create a new play list or edit play list after the number of registered play lists has reached the upper limit (99) that is defined by the DVD video recording format.	Delete unnecessary scenes before creating a new play list or editing play list.

Message	Cause/condition for message to appear	Troubleshooting
Same scenes on Play List will be deleted. Delete scenes? YES NO	This message appears during user operation, if even one play list has been created during scene deletion. This message does not appear when a scene is deleted from play list.	Choose “YES” and designate it to delete selected scenes.
Scenes over limit. Cannot add scene.	Appears if an attempt is made to register a new scene in play list, with the specified 999 upper limit scenes registered. [Refer to *1 page 4-8]	Delete unnecessary scenes from play list before adding a new scene to it.
Scenes over limit. Cannot divide scene.	Appears if an attempt is made to divide a scene with the specified 999 upper limit scenes registered, or the number of scenes will exceed 999 with division. [Refer to *1 page 4-8]	Delete unnecessary scenes before dividing a scene.
Scenes over limit. Cannot move scene.	Appears if an attempt is made to move a scene at the upper limit of 999 scenes registered, or the number of scenes will exceed 999 by moving a scene. [Refer to *1 page 4-8]	Delete unnecessary scenes before moving scenes.
Stop processing.	This message appears during operation process. It will appear when user interrupted any process by pressing the stop/cancel button when processing multiple scenes, etc.	Operate the DVD video camera/ recorder after the message disappears.
There was no scene which can be deleted.	Appears when only multiple locked scenes were selected using the Disc Navigation function, and deleting them was attempted.	Use the Disc Navigation function to unlock the scenes, and then restart operation.
This card cannot be used. Please replace card.	Appears when a card other than SD memory card was loaded.	Insert an SD memory card.
This disc cannot be used. Please replace disc.	Appears when a type of disc that cannot be used on the DVD video camera/ recorder was loaded.	Check the type of disc and insert a disc usable on the DVD video camera/ recorder.
This disc is recorded by the PAL system. Please replace disc.	Appears when a disc recorded in the PAL system was loaded: This DVD video camera/recorder is exclusively for the NTSC system and does not comply with the PAL system.	Use a disc recorded in the NTSC system.
Top scenes cannot be divided.	Appears when the first image of scene was selected to divide the scene: The specifications state that dividing a scene at its top is not possible.	Stop trying to divide a scene.
UNFORMAT DISC	Appears when an unformatted or logically damaged disc was loaded.	Format the disc (deleting all recorded data), or replace the disc.
	Also appears when a dirty disc was loaded.	Refer to “4-4-4 Cleaning disc and optical pickup” and clean the disc. Or replace the disc.

Message	Cause/condition for message to appear	Troubleshooting
Use AC adapter/charger.	Appears if a battery is used when finalizing a DVD-R. The specifications state that DVD-R can be finalized only when the AC adapter/charger powers the DVD video camera/recorder.	Terminate the Disc Navigation function, set the power switch to "OFF" with the disc loaded, remove the battery, and then connect the AC adapter/charger: Finalize the disc again.
Use AC adapter/charger. Turn off power.	Appears if a battery is used when repairing video files. The specifications state that video files can be repaired only when the AC adapter/charger powers the DVD video camera/recorder.	Set the power switch to "OFF" with the disc loaded, remove the battery, and then connect the AC adapter/charger. [Refer to *3 page 4-11]
VIDEO scene cannot be copied to card.	Appears if an attempt is made to copy video to card. The specifications state that no video is unrecordable on card.	Stop trying to copy a video, or select photos and execute copy.
Write protected. Check disc.	Appears if a DVD-RAM that was write-protected for disc units by software disc-protect function is loaded, or if an attempt is made to record on write-protected disc.	Release the software disc-protect.
Write-protected. Check card.	Appears when an SD memory card whose erasure prevention switch was locked is loaded.	Unlock the erasure prevention switch of SD memory card.

Note:
The listed messages are subject to change without notice for improvement of performance.

4-4 Display of Error Codes and Troubleshooting

Restriction:
The information included in this section is exclusively for service personnel: Do not disclose it to persons other than service engineers.

The DVD video camera/recorder is equipped with a self-diagnostic function: If the DVD video camera/recorder detects any problem, it will choose an appropriate error code (4-digit alphanumeric) and store it in flash memory: Display the error code to perform troubleshooting, according to the content.

4-4-1 Displaying error codes and clearing them

(1) Display method

1) Use the battery or AC adapter/charger to power the DVD video camera/recorder.
2) Set the power switch to the position shown below. Then operate the DVD video camera/recorder while watching the LCD monitor or viewfinder screen:
   a) Both disc and card are loaded: “VIDEO” or “CARD PHOTO”
   b) Only disc is loaded: “VIDEO”
   c) Only card is loaded: “CARD PHOTO”
   d) Neither disc nor card is loaded: “VIDEO”
3) When a disc or card, or both are loaded, press the DISC NAVIGATION button to display the thumbnail screen. If neither disc nor card is loaded, this step is not necessary.
4) Display the error code screen using the following button operation:
   Simultaneously press the SELECT, REC and ⏭ buttons.

(2) Display clearing method

1) When neither disc nor card is loaded, press the STOP/CANCEL button to restore the normal screen. When a disc or card is loaded, press the STOP/CANCEL button to restore the thumbnail screen. To restore the normal screen, press the STOP/CANCEL button again or press the DISC NAVIGATION button.

4-4-2 Details of error code display

Up to eight error codes of problems can be displayed with the dates/times when the problems occurred.
If the same problem occurs repeatedly, it will be judged as one problem, and the same error code will not continue to appear.
If more than eight problems occur, the error codes will be erased beginning with the oldest problem, and the code for the newest problem will be recorded.
If no error code is recorded, the line for error code and problem occurrence date/time will be all zero (0).

Information:
To erase all error codes and reset to the default status, perform system reset (remove the battery and AC adapter/ charger, and use a fine-tipped pen to hold down the reset button for several seconds).

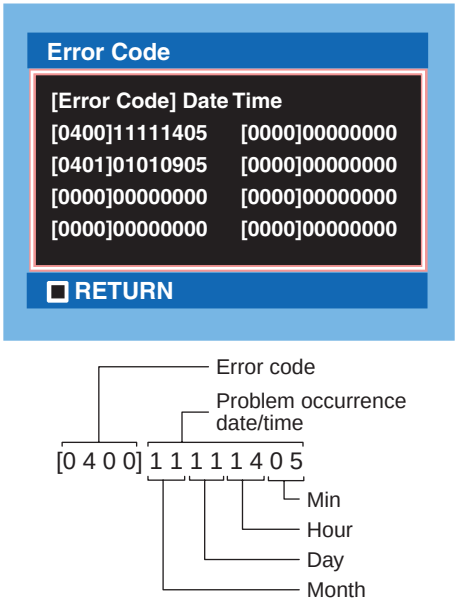


Fig. 4-4-1 Example of Error Code Display

4-4-3 Major error codes and troubleshooting

Table 4-4-1 shows the error codes that are likely to frequently appear, and appropriate troubleshooting.
If error codes other than those listed in Table 4-4-1 appear, check with the factory for troubleshooting.

Table 4-4-1 Major Error Codes and Troubleshooting

Error code	Contents of problem	Troubleshooting
0200	Optical pickup failed to move.	Refer to “Disc load check flowchart” on the page 4-21.
0280		
0400	Recognition of disc failed.	
0401	Optical pickup was faulty.	Replace the disc drive unit.
040D	No disc	Load a disc.
1001	DVD-R was not formatted.(*1)	Format the DVD-R.
1100	Reading data from disc failed.	Refer to “Disc load check flowchart” on the page 4-21.
2881	Recognition of disc failed.	Refer to “Disc load check flowchart” on the page 4-21.
3105	Recording photos failed because of condensation in disc drive unit (optical pickup) or dirt on optical pickup.	Set the power switch to “OFF”, and then leave the DVD video camera/recorder in a dry place until condensation disappears (for at least 1-2 hours).
		Clean the optical pickup, referring to “4-4-4 Cleaning disc and optical pickup”.

Error code	Contents of problem	Troubleshooting
3122	Recording on DVD-RAM failed because it was subject to vibrations or impact when it was being accessed.	Any vibration or impact to disc while it is being accessed will result in no recording.
7601	Optical pickup was faulty.	Replace the disc drive unit.
A080	Reading signal from disc failed due to condensation or dirt on disc.	With the disc left loaded, set the power switch to "OFF", and then leave the DVD video camera/recorder in a dry place until condensation disappears (for at least 1-2 hours).
		Clean the optical pickup, referring to "4-4-4 Cleaning disc and optical pickup".
EC87	Emergency stop occurred while data was being read or written from/to disc.	Refer to "Disc load check flowchart" on the page 4-21.
F100	Buffer overflowed during recording due to foreign object in the vicinity of optical pickup, or optical pickup was faulty.	Remove the foreign object, taking care that the optical pickup is not damaged.
		Replace the disc drive unit.
F571	Recording photos failed.	Replace the disc drive unit.
F573	Recording videos failed due to magnetic substance in the vicinity of optical pickup.	Remove the magnetic substance, taking care that the optical pickup is not damaged.
F700	Disc drive unit (DRV circuit board) was faulty.	Replace the disc drive unit.
FB00	Optical pickup was faulty.	
FE80	Process of writing data to disc failed.	Refer to "Disc load check flowchart" on the page 4-21.

*1: "Formatting DVD-R on the DVD video camera/recorder" is a format exclusively for camera recording: It is necessary to write images recorded on the DVD video camera/recorder in real time (in order to enhance the responsiveness of DVD-R).

Disc Load Check Flowchart

Check the following only when an instruction for referring to this chart is given in "Table 4-4-1 Major Error Codes and Troubleshooting" on the previous page.

Caution

Laser light striking the eye may cause your eyesight to be lost: For safety, be sure to remove any power supply (AC adapter/charger, battery, etc.) from the DVD video camera/recorder before starting work.

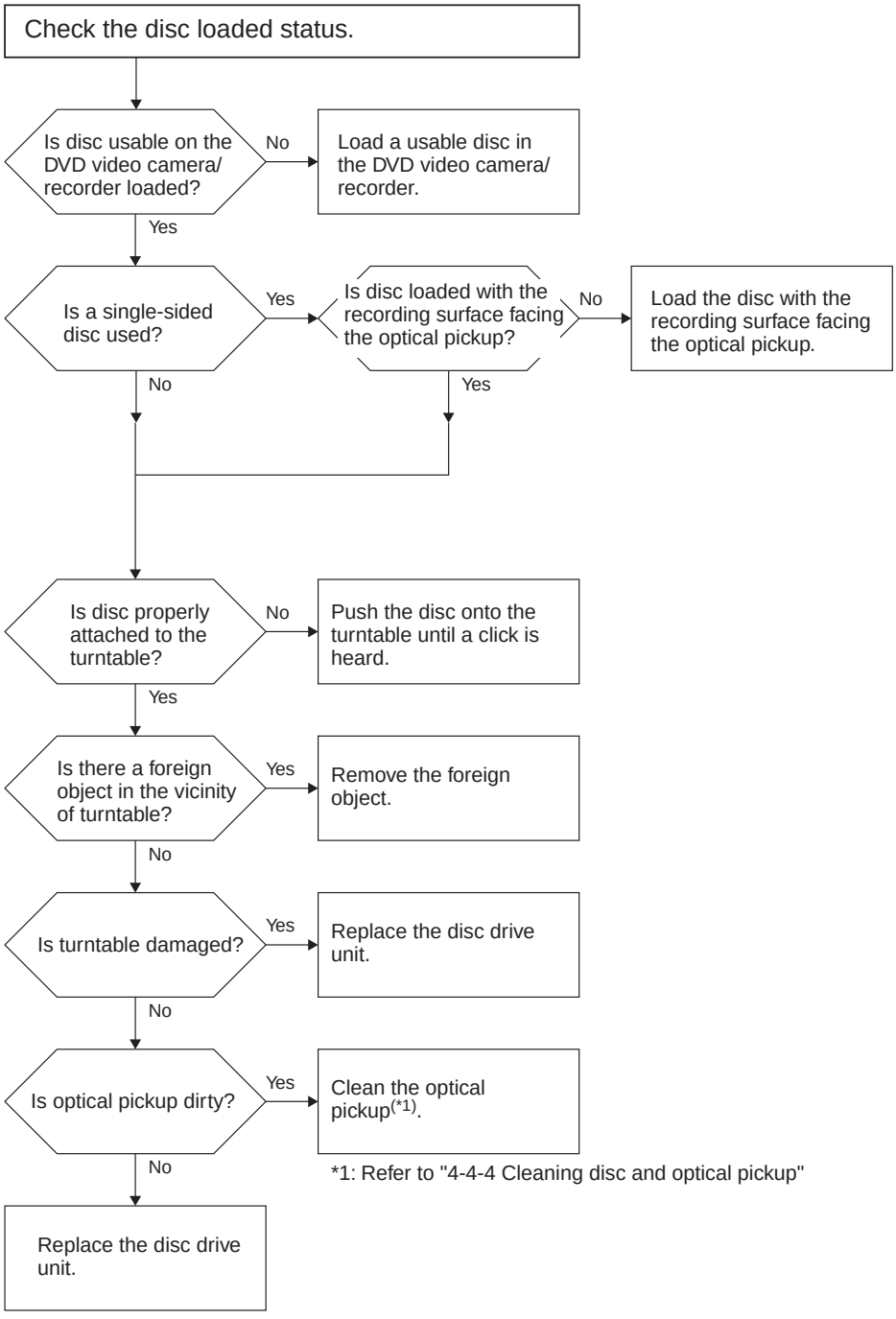

Check the disc loaded status.
Is disc usable on the DVD video camera/ recorder loaded?
No
Load a usable disc in the DVD video camera/ recorder.
Yes
Is a single-sided disc used?
Yes
Is disc loaded with the recording surface facing the optical pickup?
No
Load the disc with the recording surface facing the optical pickup.
No
Yes
Is disc properly attached to the turntable?
No
Push the disc onto the turntable until a click is heard.
Yes
Is there a foreign object in the vicinity of turntable?
Yes
Remove the foreign object.
No
Is turntable damaged?
Yes
Replace the disc drive unit.
No
Is optical pickup dirty?
Yes
Clean the optical pickup(*1).
No
Replace the disc drive unit.
*1: Refer to "4-4-4 Cleaning disc and optical pickup"

Fig. 4-4-2 Disc Load Check Flowchart

4-4-4 Cleaning disc and optical pickup

(1) Cleaning disc

1) Use the provided disc cleaning cloth, or a soft, dry cloth to lightly clean the disc from the inner to outer edges in axial direction.
2) If the dirt cannot be removed with the above procedure, put a few droplets of absolute alcohol in a soft, dry cloth, and use it to lightly clean the disc from the inner to outer edges in axial direction.

Fig. 4-4-3 Cleaning Disc

Information:
The following disc cleaners and cleaning cloths (generally available) are also usable:
a) KS2424-X00 Toraysee (cleaning cloth only) produced by Toray
b) LF-K200DCJ1 DVD-RAM/PD disc cleaner (cleaning cloth and cleaning liquid) produced by Panasonic
c) OC-CS MO disc cleaner (cleaning cloth and cleaning liquid) produced by Hitachi Maxell

(2) Cleaning optical pickup

Note:
Do not clean the optical pickup needlessly. The optical pickup is a precision component. Repeated cleaning could cause a fault.

1) Attach the AC adapter/charger or battery (power supply), and then press the DISC EJECT button to open the disc insertion block.
2) Remove the AC adapter/charger or battery (power supply).

Caution

Laser light striking the eye may cause your eyesight to be lost: For safety, be sure to remove any power supply (AC adapter/charger, battery, etc.) from the DVD video camera/recorder before starting work.

3) Check to see whether the optical pickup is dirty: If it is not dirty, cleaning is not necessary.

If the optical pickup is dirty, use the following procedure to clean it:

a) Drip one droplet of absolute alcohol on a cotton swab(*1). Lens cleaner liquid for CD/DVD (generally available) is also usable in place of absolute alcohol.

b) Use the cotton swab to clean the optical pickup in the direction of the arrow using just enough force that it lightly goes down: Using undue force or incorrect cleaning direction could cause a fault.

*1: Use a cotton swab free from any additive or chemical: Those made by Jhonson&Jhonson are recommended. Never reuse a used cotton swab.

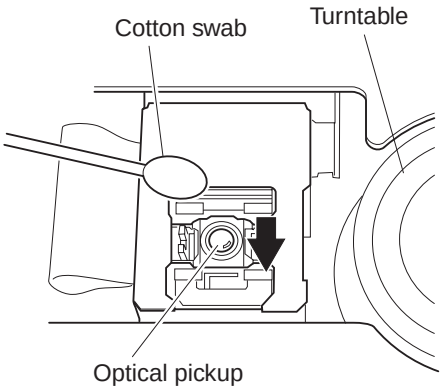


Fig. 4-4-4 Cleaning Optical Pickup

4-5 Checking Versions of Firmware and Updating

The DVD video camera/recorder stores in flash memory the five types of firmware program shown in Table 4-5-1. These firmware programs can be updated whenever necessary to improve performance.

Check to see whether any defects in the DVD video camera/recorder can be eliminated by updating any firmware programs: If improvement is likely, update them.

Information:

The information on how to upgrade the firmware, obtain firmware data and create a disc or card containing upgraded firmware will be reported on service bulletin, etc.

Table 4-5-1 List of DVD video camera/recorder Firmware Programs

Type of firmware	Description
System firmware	Controls the operation of entire system, including recording, playback, Disc Navigation, connections with external devices, clock, battery, input/output etc..
Camera microprocessor firmware	Controls the operation of camera block (including optical system).
Drive main firmware	These programs control the DVD disc drive system (mechanism block)
Drive core firmware	
Loader firmware	Performs settings when the DVD video camera/recorder starts

4-5-1 Checking firmware versions

(1) Version check screen display method

1) Attach the AC adapter/charger to power the DVD video camera/recorder.
2) Set the power switch to the position shown below. Then operate the DVD video camera/recorder while watching the LCD monitor or viewfinder screen:
   a) Both disc and card are loaded: “VIDEO” or “CARD PHOTO”
   b) Only disc is loaded: “VIDEO”
   c) Only card is loaded: “CARD PHOTO”
   d) Neither disc nor card is loaded: “VIDEO”
3) While a disc or card, or both, are loaded, press the DISC NAVIGATION button to display the thumbnail screen. If neither disc nor card is loaded, this step is not necessary.
4) Display the version check screen (version or information display screen) using the following button operation:
   Simultaneously press the SELECT, REC and ⏮ buttons.

Information:
The display contents on version and detail screens are identical, except for the titles at the top left of screen.
The version screen is a version check screen used when either disc or card is loaded, or when both disc and card are loaded. The detail display screen is a version check screen used when neither disc nor card is loaded.

(2) Version check screen display clearing method

1) When neither disc nor card is loaded, press the stop/cancel button to restore the normal screen.
   When a disc or card is loaded, press the stop/cancel button to restore the thumbnail screen.
   To restore the normal screen, press the stop/cancel button again or press the DISC NAVIGATION button.

(3) Details of information display/version screens

Table 4-5-2 Detail/Version Screens

Item	Display content
Model	Model name
System	System firmware version number
Camera	Camera microprocessor firmware version number
Drive (Main)	Drive main firmware version number
Drive (Core)	Drive core firmware version number

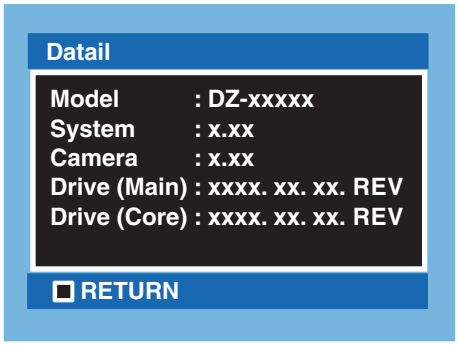
Information:

1) The version number of loader firmware cannot be confirmed on the information display/version screen because of design limitations.
2) With actual screens, figures and letters will appear in digits displayed as x on illustrations.
3) The number at the bottom right of screens shows the operation hours of disc drive unit: Use this for reference to determine how long the customer has used the DVD video camera/recorder.

   Example: 10355: 103 hours 55 minutes

   This number will not appear, however, when the power switch is set to "CARD PHOTO". When the disc drive unit is replaced, the operation hours of the newly assembled unit will appear.

When no disc is loaded



When disc is loaded

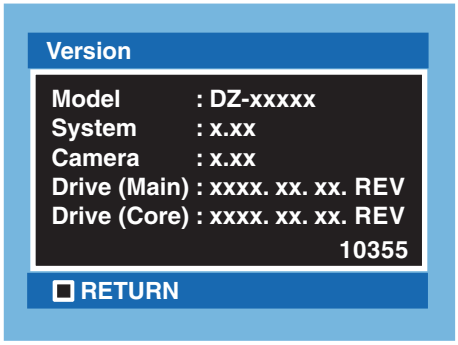


Fig. 4-5-1 Example of Display on Detail/Version Screens

4-5-2 Updating firmware

If you receive information from the factory on service bulletin, etc. that updating firmware is needed, you should update to improve the performance, functions and operability of DVD video camera/recorder.

1) Acquire the data for updating of firmware and create a disc or card for updating: Information on how to do this will be reported on service bulletin, etc.
2) Set the power switch to "OFF", and then use the AC adapter/charger to power the DVD video camera/recorder: A battery cannot be used to do this because it may interrupt power of DVD video camera/recorder during updating.
3) Insert the disc/card for updating.
4) Set the power switch to "VIDEO" when using a disc for updating, or to "CARD PHOTO" when sing a card for updating.

5) After approx. 20 seconds, the updating start screen (Fig. 4-5-2) will appear, and the firmware programs will be automatically updated thereafter. During updating, screens showing that designated firmware program is being updated will appear, followed by screen showing that updating is complete.
   Not all firmware programs need updating every time: If the version of the data on disc/card for updating is identical to that of firmware stored in DVD video camera/recorder, the same version screen will appear.
6) When all required updating is complete, the screen for verifying the version of updated firmware will appear, and the updated firmware will be displayed in red.
7) To complete updating, set the power switch to "OFF", and then remove the disc/card for updating.

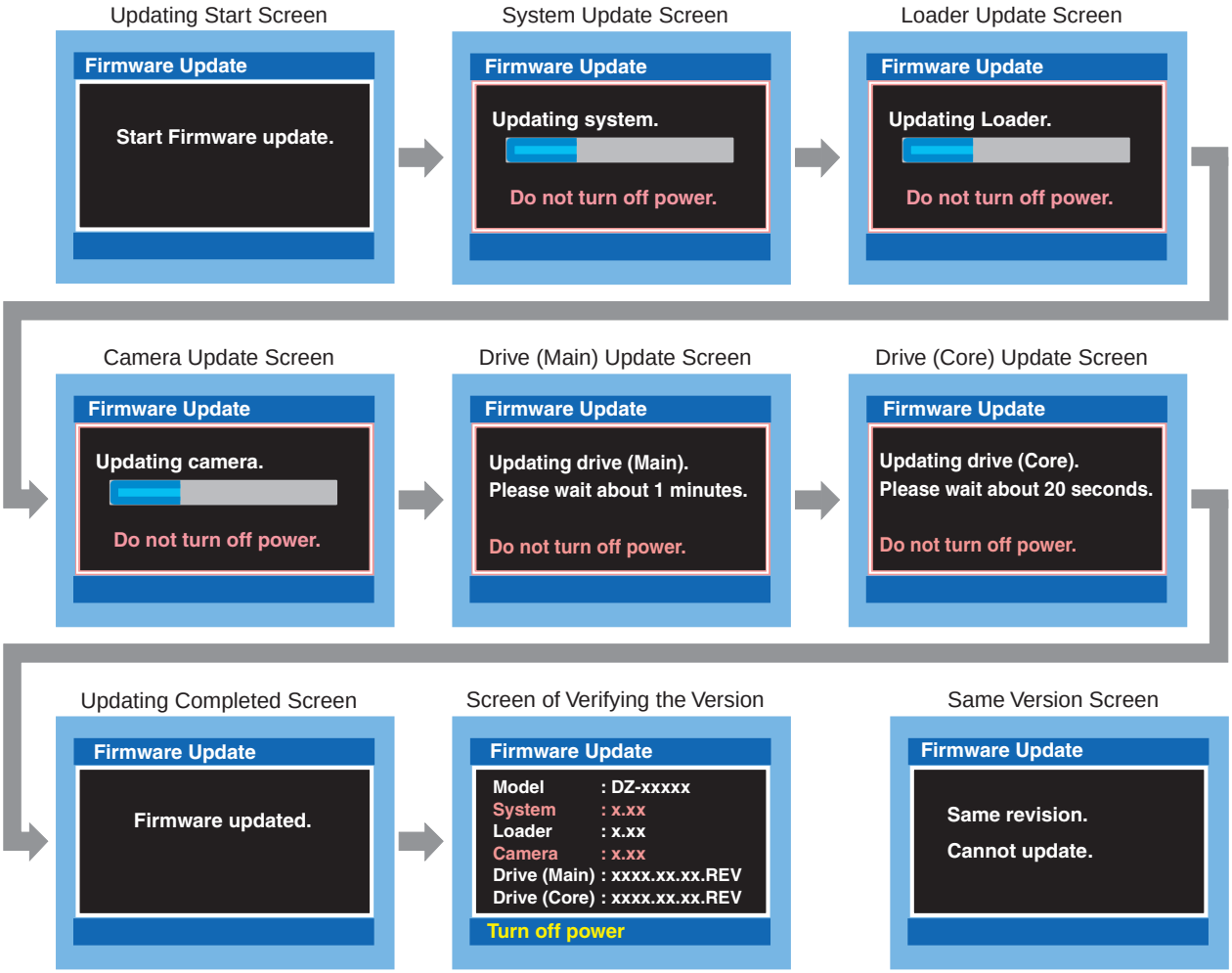


Fig. 4-5-2 Example of Display on Updating Firmware

4-6 Trouble Diagnosis

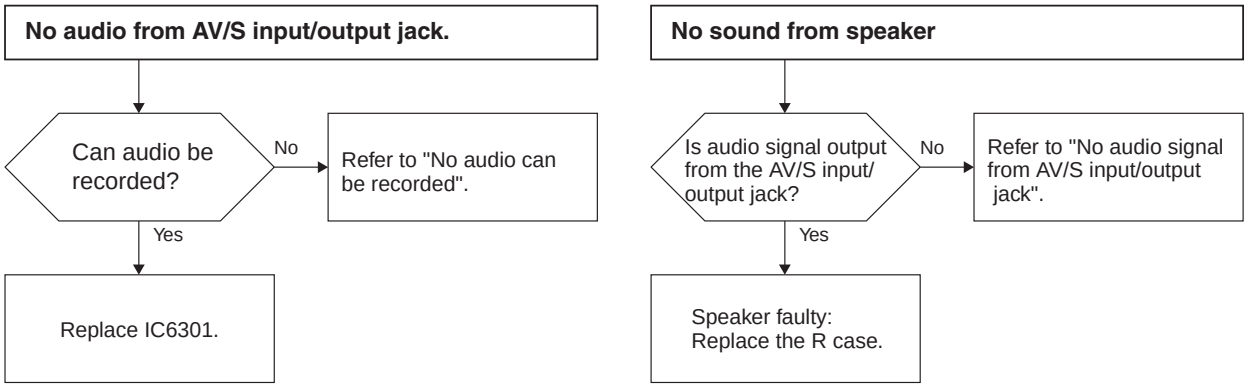
Information:
1) Use the DZ-ACS2 AC adapter/charger to power the DVD video camera/recorder for trouble diagnosis.
2) The trouble diagnosis flowchart was prepared presupposing that the circuit boards have been normally attached and connected. Therefore, make sure beforehand that the circuit boards are correctly connected, that connectors and cables are not damaged, and that the status of their connections is correct.

Cautions
1) The DZ-GX20A incorporates a high-voltage flash unit. Use countermeasures to prevent electric shock, such as wearing gloves, and take great care during work. The flash unit keeps its high voltage even if the power supply (AC adapter/charger, battery, etc.) is removed.
2) Never look into the objective lens of optical pickup block in disc drive unit, and take great care that the reflected laser beam does not strike your eye: Doing so could cause serious vision damage.

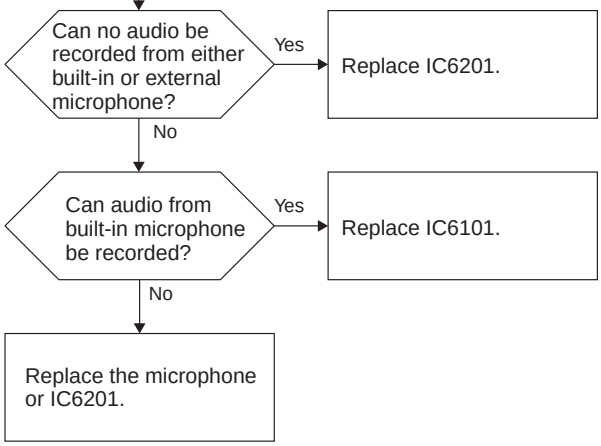
4-6-1 Trouble diagnosis flowchart

Interpreting the trouble diagnosis flowchart:

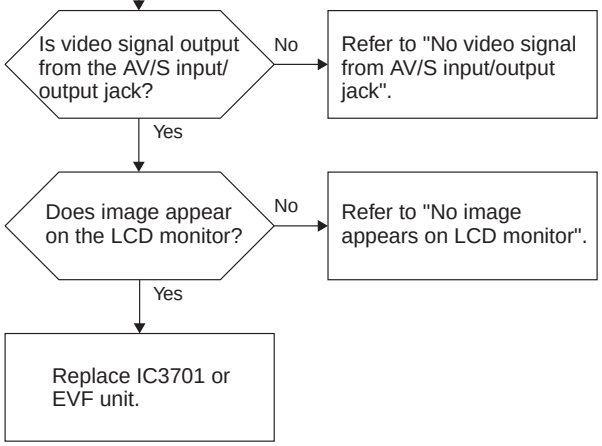
1) If removing any component is stated in the flowchart, remove that component, referring to "5. Disassembly and Reassembly".
2) If "Solder a lead wire to check point" is stated, solder a lead wire of approx. 10 cm according to the list of check point: Be sure to remove the lead wire after trouble diagnosis is finished.
3) If "Set to service position (A) or (B)" is given in the flowchart, set the DVD video camera/recorder to the appropriate service position, referring to "4-6-2 Reassembly to enable service position".


No audio from AV/S input/output jack.
Can audio be recorded?
No
Refer to "No audio can be recorded".
Yes
Replace IC6301.
No sound from speaker
Is audio signal output from the AV/S input/ output jack?
No
Refer to "No audio signal from AV/S input/output jack".
Yes
Speaker faulty: Replace the R case.

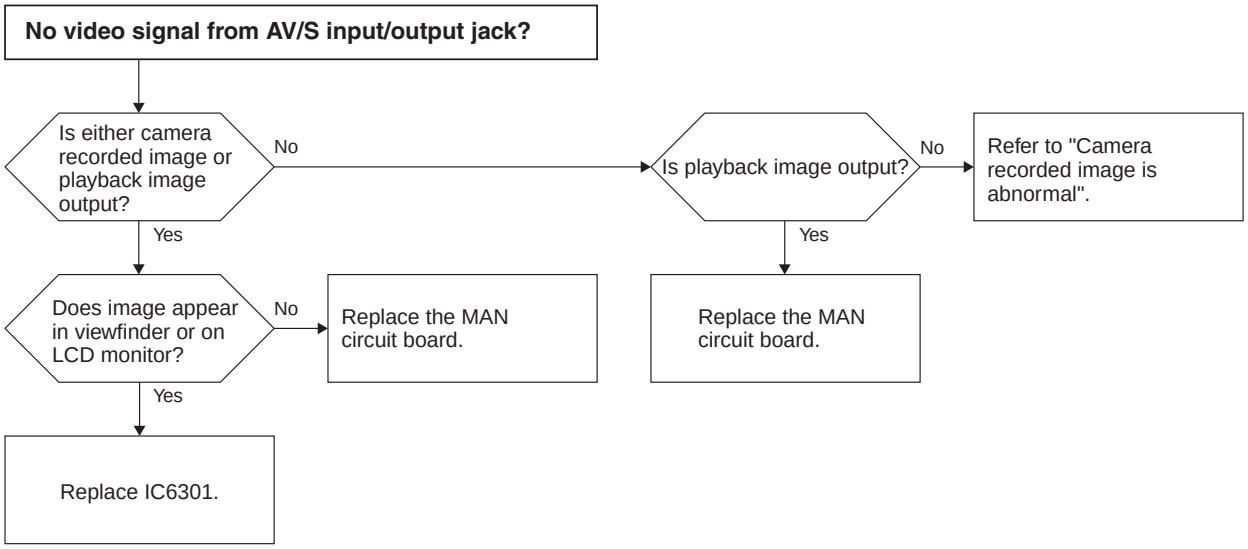
No audio can be recorded.



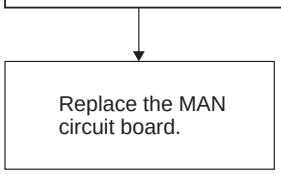
No image appears in viewfinder.


Is video signal output from the AV/S input/ output jack?
No
Refer to "No video signal from AV/S input/output jack".
Yes
Does image appear on the LCD monitor?
No
Refer to "No image appears on LCD monitor".
Yes
Replace IC3701 or EVF unit.

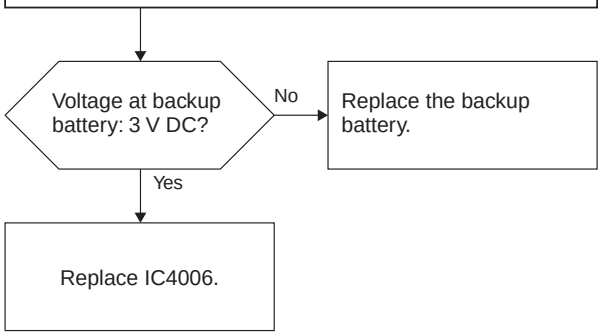
No video signal from AV/S input/output jack?

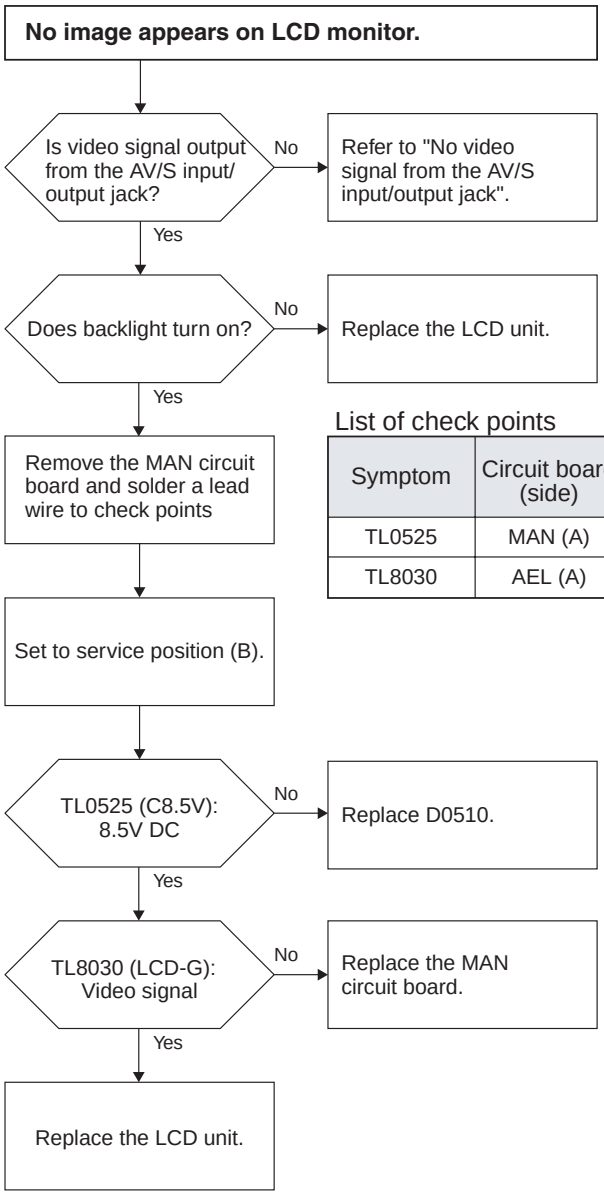


Block noise occurs during recording of video.



Date or time is not set.




No image appears on LCD monitor.
Is video signal output from the AV/S input/ output jack?
No
Refer to "No video signal from the AV/S input/output jack".
Yes
Does backlight turn on?
No
Replace the LCD unit.
Yes
Remove the MAN circuit board and solder a lead wire to check points
Set to service position (B).
TL0525 (C8.5V): 8.5V DC
No
Replace D0510.
Yes
TL8030 (LCD-G): Video signal
No
Replace the MAN circuit board.
Yes
Replace the LCD unit.

List of check points

Symptom	Circuit board (side)	Location on circuit board	Lead wire soldered or not
TL0525	MAN (A)	1B	Need
TL8030	AEL (A)	1C	Need not

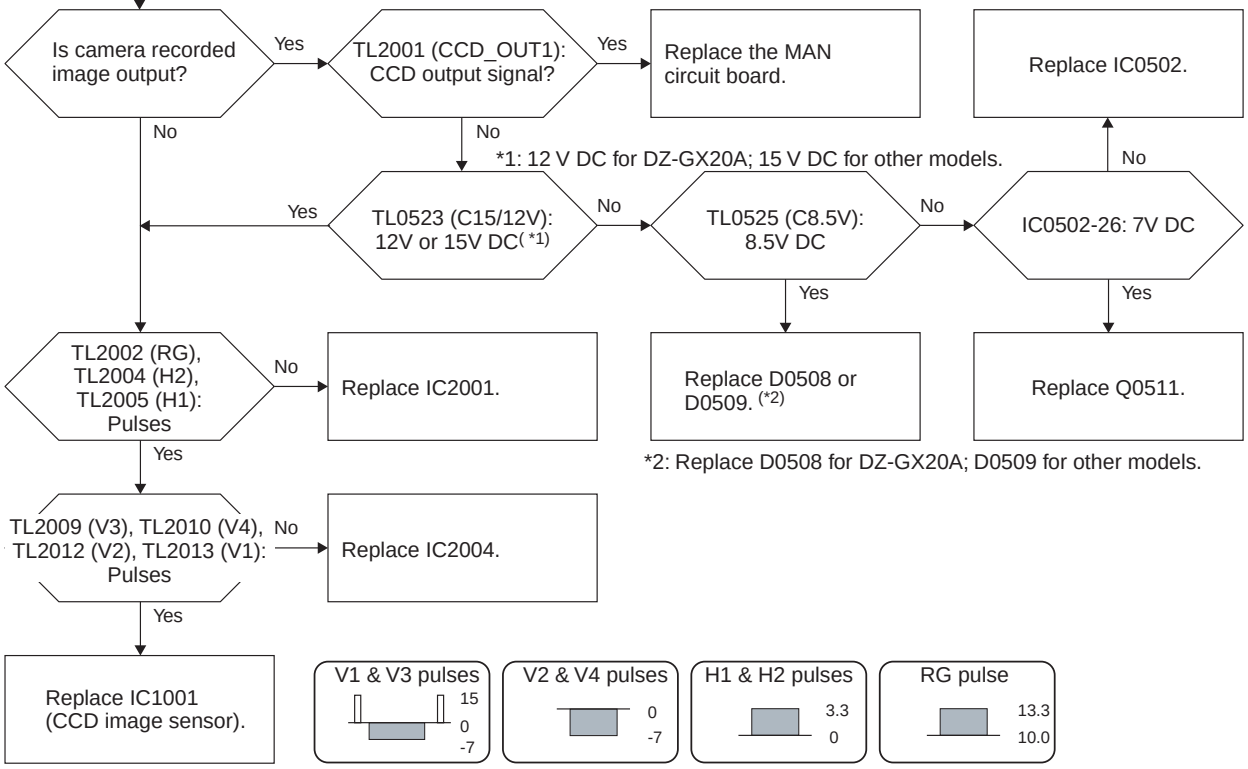
Camera recorded image is abnormal

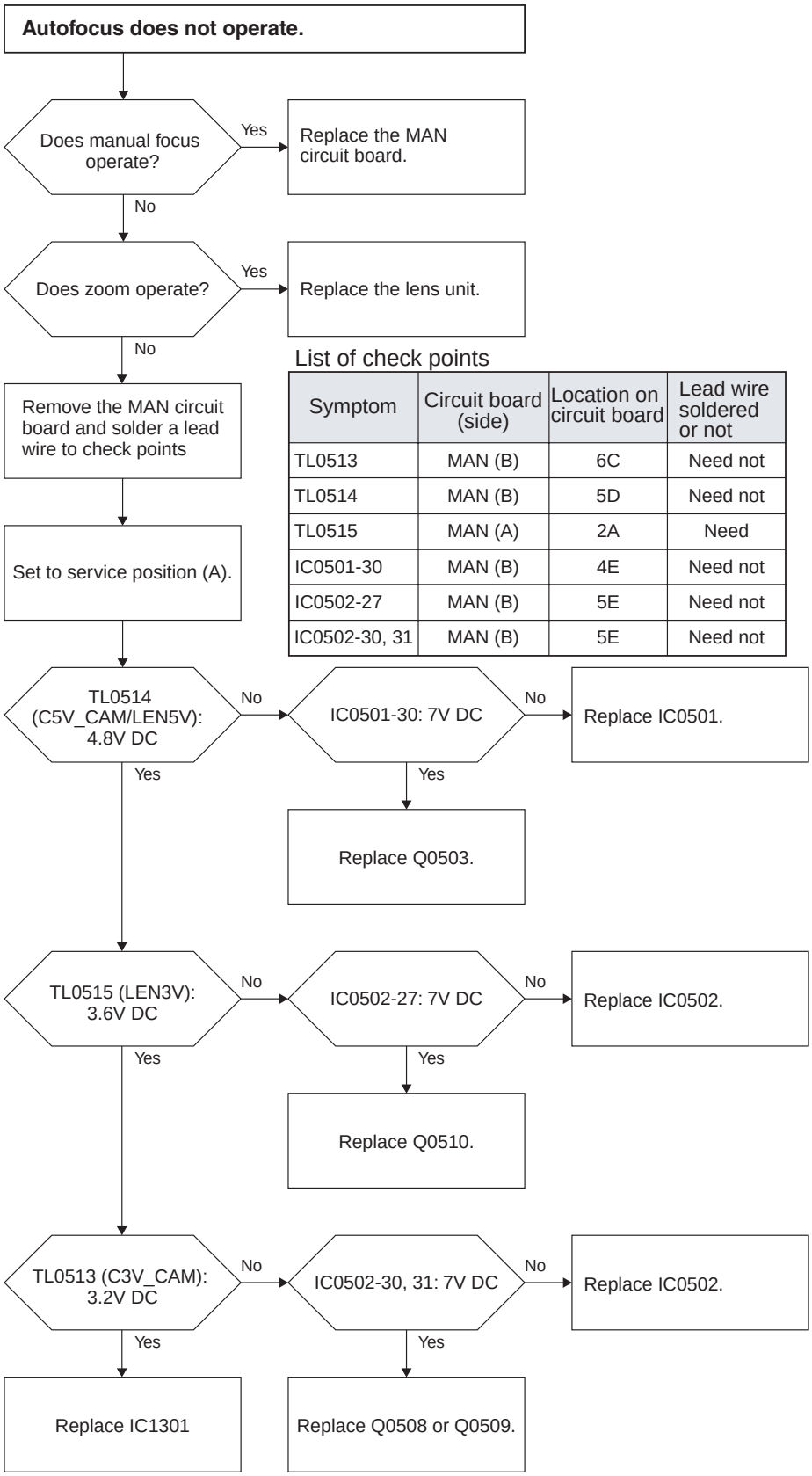
Remove the MAN circuit board and solder a lead wire to check points

Set to service position (A).

List of check points

Symptom	Circuit board (side)	Location on circuit board	Lead wire soldered or not
TL0523	MAN (A)	3B	Need
TL0525	MAN (A)	1B	Need
TL2001	MAN (B)	4C	Need not
TL2002	MAN (A)	3B	Need
TL2004	MAN (A)	3B	Need
TL2005	MAN (A)	3B	Need
TL2009	MAN (A)	3C	Need
TL2010	MAN (A)	3B	Need
TL2012	MAN (A)	3C	Need
TL2013	MAN (A)	3B	Need
IC0502-26	MAN (B)	5E	Need not





List of check points

Symptom	Circuit board (side)	Location on circuit board	Lead wire soldered or not
TL0513	MAN (B)	6C	Need not
TL0514	MAN (B)	5D	Need not
TL0515	MAN (A)	2A	Need
IC0501-30	MAN (B)	4E	Need not
IC0502-27	MAN (B)	5E	Need not
IC0502-30, 31	MAN (B)	5E	Need not

Operation buttons on L case do not function.

Remove the L block

Set to service position (B).

List of check points

Symptom	Circuit board (side)	Location on circuit board	Lead wire soldered or not
TL8002	AEL (A)	1C	Need not
TL8003	AEL (A)	1C	Need not
TL8004	AEL (A)	1C	Need not
TL8006	AEL (A)	1C	Need not

Does MENU button function?
- Yes → TL8002 (MENU): 0V(*1)
  - Yes → Replace the MAN circuit board.
  - No → MENU button faulty: Replace the L case.
- No

*1: When MENU button is pressed.

Does SELECT button function?
- Yes → TL8003 (SELECT): 0V(*2)
  - Yes → Replace the MAN circuit board.
  - No → SELECT button faulty: Replace the L case.
- No

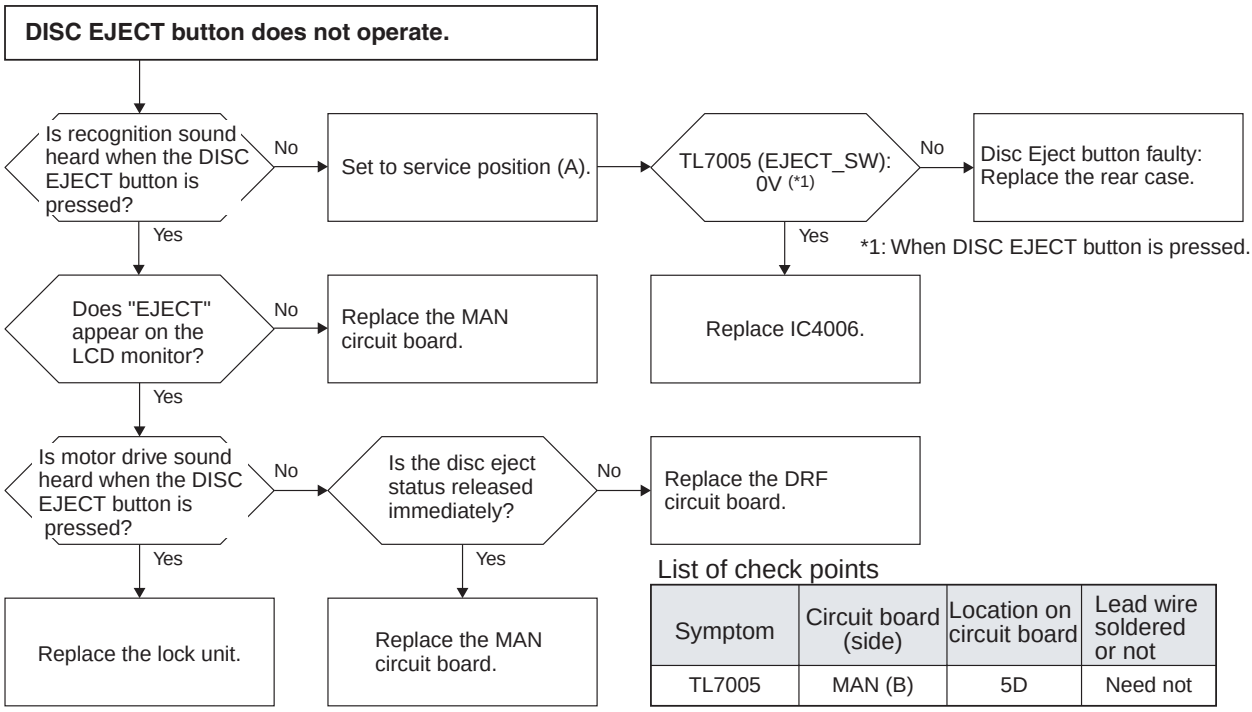
*2: When SELECT button is pressed.

Does DISC NAVIGATION or STOP/CANCEL button function?
- Yes → TL8004 (KEY1): Does the voltage vary?(*3)
  - Yes → Replace the MAN circuit board.
  - No → Button faulty: Replace the L case.
- No

*3: When the do not function button is pressed.

TL8006 (KEY2): Does the voltage vary?(*3)
- Yes → Replace the MAN circuit board.
- No → Button faulty: Replace the L case.

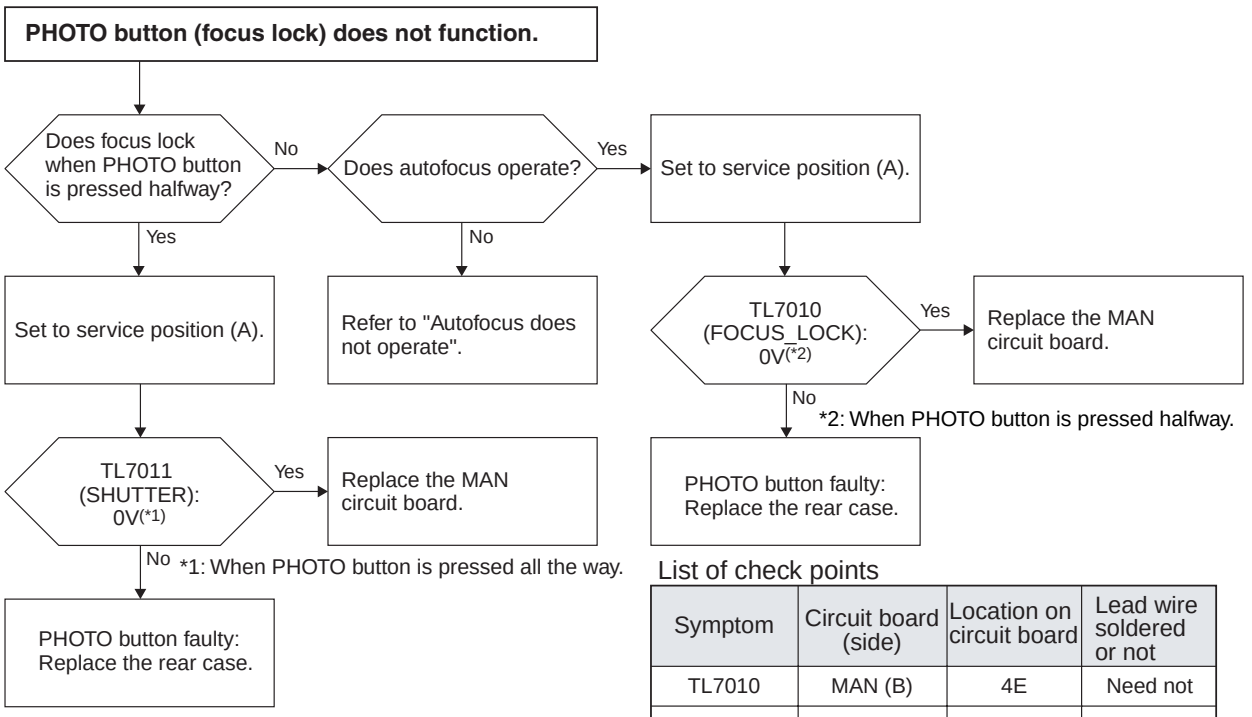
DISC EJECT button does not operate.


Is recognition sound heard when the DISC EJECT button is pressed?
No
Set to service position (A).
TL7005 (EJECT_SW): 0V (*1)
No
Disc Eject button faulty: Replace the rear case.
Yes
Yes
*1: When DISC EJECT button is pressed.
Does "EJECT" appear on the LCD monitor?
No
Replace the MAN circuit board.
Replace IC4006.
Yes
Is motor drive sound heard when the DISC EJECT button is pressed?
No
Is the disc eject status released immediately?
No
Replace the DRF circuit board.
Yes
Yes
Replace the lock unit.
Replace the MAN circuit board.

List of check points

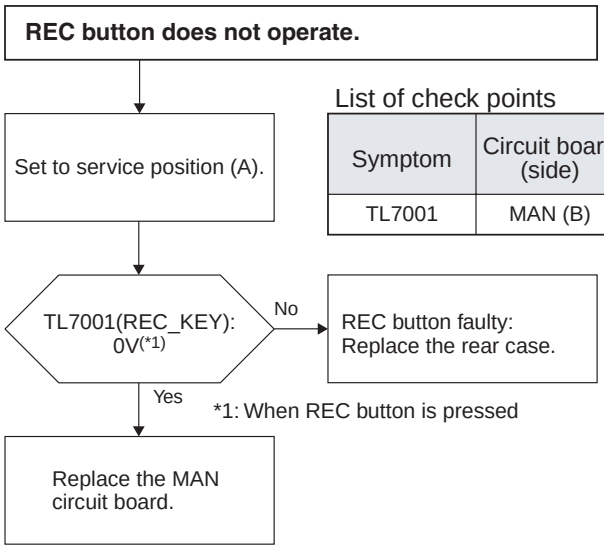
Symptom	Circuit board (side)	Location on circuit board	Lead wire soldered or not
TL7005	MAN (B)	5D	Need not

PHOTO button (focus lock) does not function.



List of check points

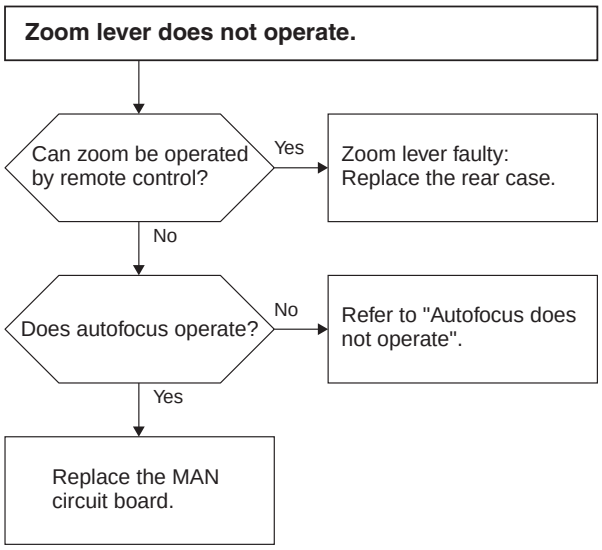
Symptom	Circuit board (side)	Location on circuit board	Lead wire soldered or not
TL7010	MAN (B)	4E	Need not
TL7011	MAN (B)	5E	Need not

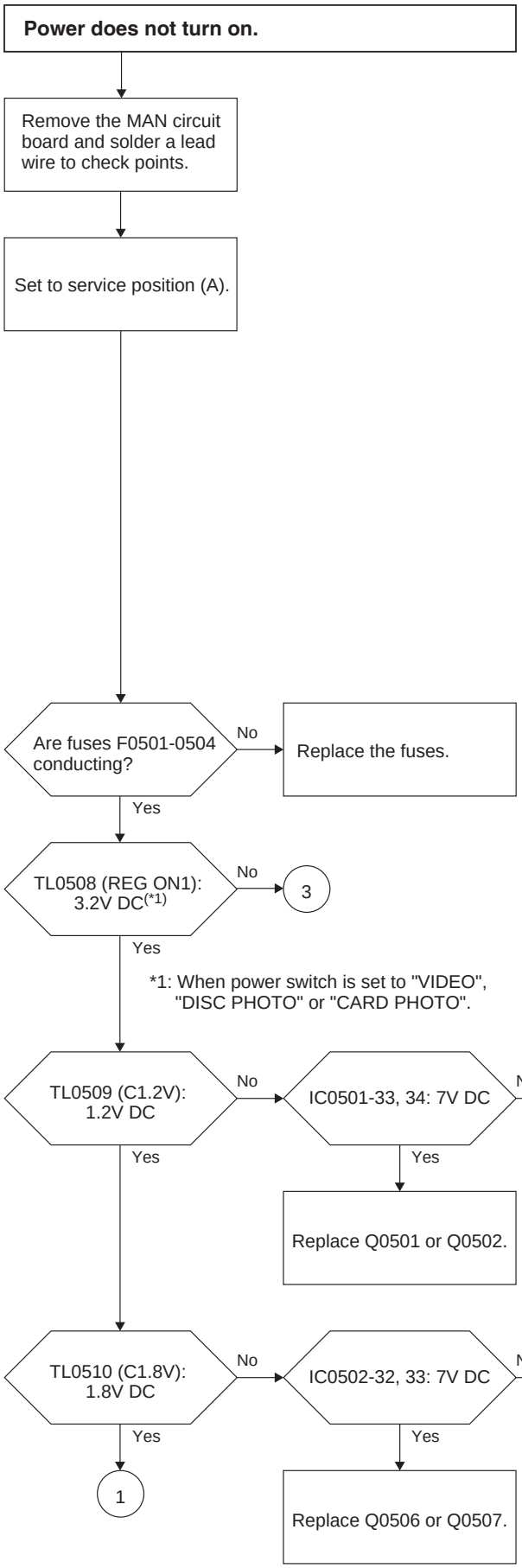


List of check points

Symptom	Circuit board (side)	Location on circuit board	Lead wire soldered or not
TL7001	MAN (B)	5D	Need not

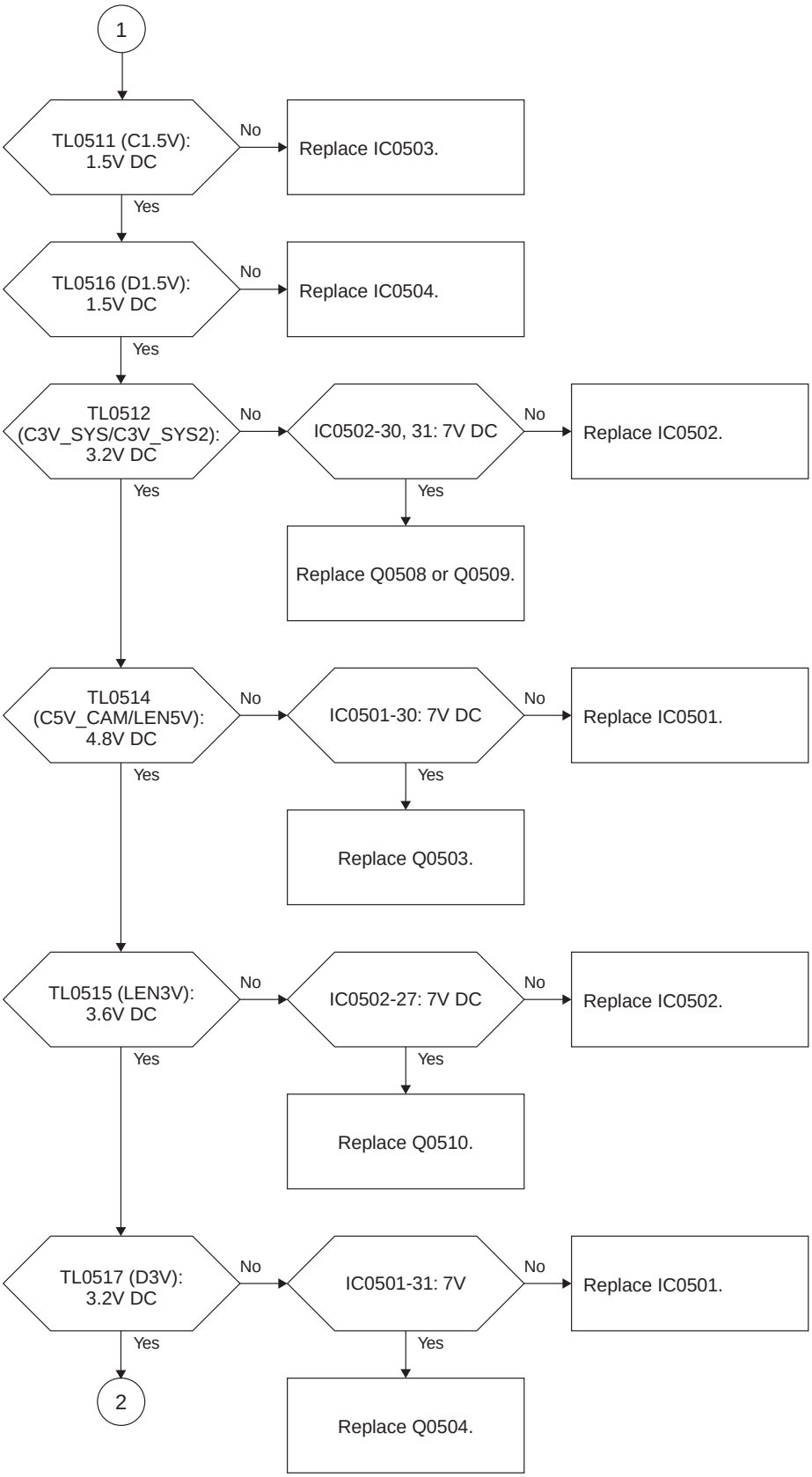
*1: When REC button is pressed

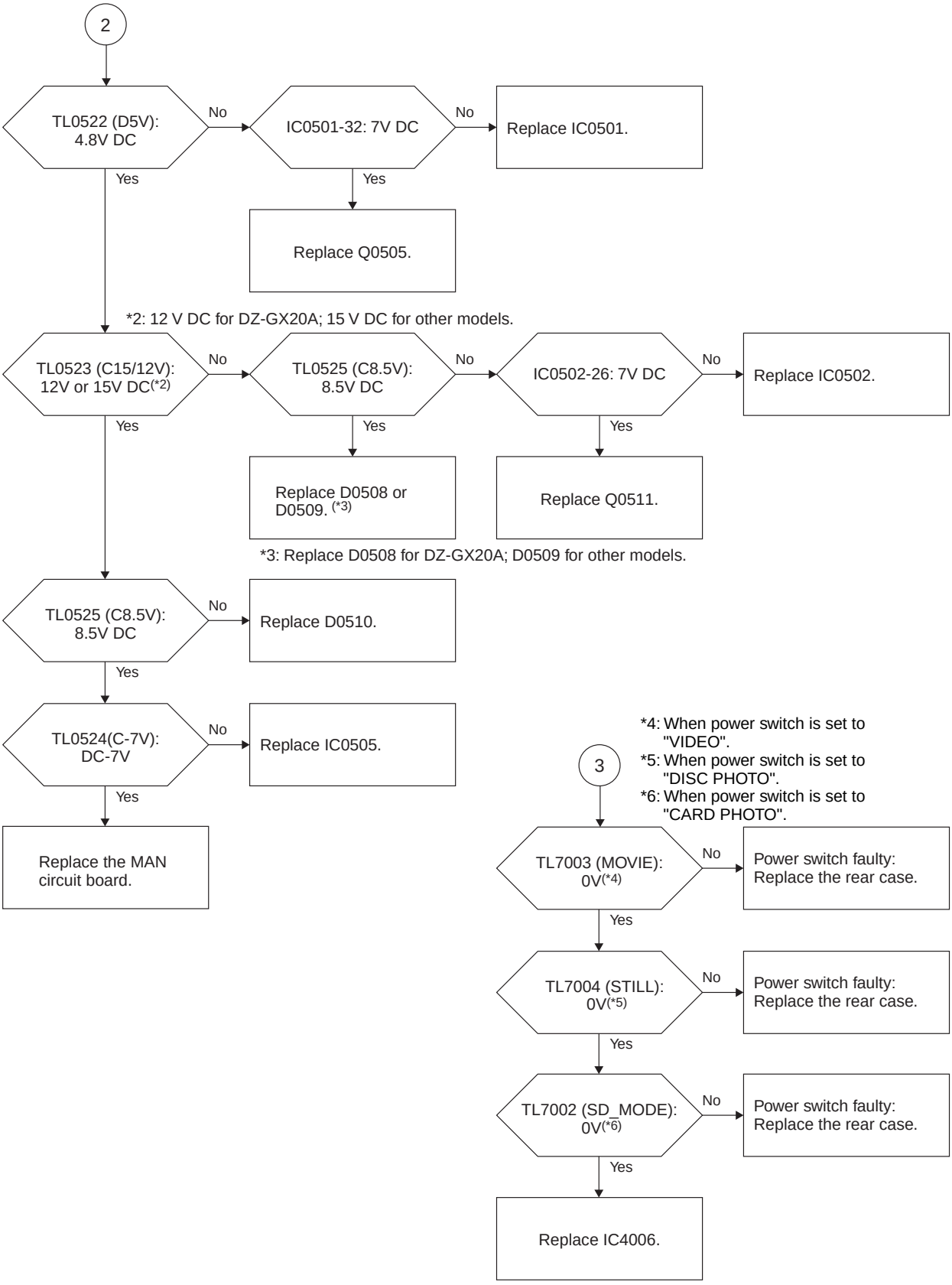




List of check points

Symptom	Circuit board (side)	Location on circuit board	Lead wire soldered or not
F0501 - 0504	MAN (B)	5D	Need not
TL0508	MAN (B)	5E	Need not
TL0509	MAN (A)	1F	Need
TL0510	MAN (A)	1F	Need
TL0511	MAN (A)	1E	Need
TL0512	MAN (B)	6E	Need not
TL0514	MAN (B)	5D	Need not
TL0515	MAN (A)	2A	Need
TL0516	MAN (A)	1E	Need
TL0517	MAN (A)	3E	Need
TL0522	MAN (B)	5E	Need not
TL0523	MAN (A)	3B	Need
TL0524	MAN (B)	4C	Need not
TL0525	MAN (A)	1B	Need
TL7002	MAN (B)	6D	Need not
TL7003	MAN (B)	6D	Need not
TL7004	MAN (B)	6D	Need not
IC0501-30	MAN (B)	4E	Need not
IC0501-31	MAN (B)	4E	Need not
IC0501-32	MAN (B)	4E	Need not
IC0501-33	MAN (B)	4E	Need not
IC0502-26	MAN (B)	5E	Need not
IC0502-27	MAN (B)	5E	Need not
IC0502-30, 31	MAN (B)	5E	Need not
IC0502-32, 33	MAN (B)	5E	Need not


1
TL0511 (C1.5V): 1.5V DC
No
Replace IC0503.
Yes
TL0516 (D1.5V): 1.5V DC
No
Replace IC0504.
Yes
TL0512 (C3V_SYS/C3V_SYS2): 3.2V DC
No
IC0502-30, 31: 7V DC
No
Replace IC0502.
Yes
Yes
Replace Q0508 or Q0509.
TL0514 (C5V_CAM/LEN5V): 4.8V DC
No
IC0501-30: 7V DC
No
Replace IC0501.
Yes
Yes
Replace Q0503.
TL0515 (LEN3V): 3.6V DC
No
IC0502-27: 7V DC
No
Replace IC0502.
Yes
Yes
Replace Q0510.
TL0517 (D3V): 3.2V DC
No
IC0501-31: 7V
No
Replace IC0501.
Yes
Yes
2
Replace Q0504.


2
TL0522 (D5V): 4.8V DC
No
IC0501-32: 7V DC
No
Replace IC0501.
Yes
Yes
Replace Q0505.
*2: 12 V DC for DZ-GX20A; 15 V DC for other models.
TL0523 (C15/12V): 12V or 15V DC(*2)
No
TL0525 (C8.5V): 8.5V DC
No
IC0502-26: 7V DC
No
Replace IC0502.
Yes
Yes
Yes
Replace D0508 or D0509. (*3)
Replace Q0511.
*3: Replace D0508 for DZ-GX20A; D0509 for other models.
TL0525 (C8.5V): 8.5V DC
No
Replace D0510.
Yes
TL0524(C-7V): DC-7V
No
Replace IC0505.
Yes
Replace the MAN circuit board.
*4: When power switch is set to "VIDEO".
*5: When power switch is set to "DISC PHOTO".
*6: When power switch is set to "CARD PHOTO".
3
TL7003 (MOVIE): 0V(*4)
No
Power switch faulty: Replace the rear case.
Yes
TL7004 (STILL): 0V(*5)
No
Power switch faulty: Replace the rear case.
Yes
TL7002 (SD_MODE): 0V(*6)
No
Power switch faulty: Replace the rear case.
Yes
Replace IC4006.

Message "NO DISC" appears even if a normal disc is loaded.

Set to service position (A).

List of check points

Symptom	Circuit board (side)	Location on circuit board	Lead wire soldered or not
R7003	MAN (B)	4E	Need not

Does the voltage at R7003 (DOOR_SW) vary? (*1)

No → Replace the lock unit.

Yes → Replace the MAN circuit board.

*1: When the cover of disc insertion block is opened or closed

Recognition of disc does not start even if a normal disc is loaded.

Set to service position (A).

List of check points

Symptom	Circuit board (side)	Location on circuit board	Lead wire soldered or not
R7003	MAN (B)	4E	Need not

Does the voltage at R7003 (DOOR_SW) vary? (*1)

No → Replace the lock unit.

Yes → Replace the MAN circuit board.

*1: When the cover of disc insertion block is opened or closed

Message "Disc is not formatted. Format the disc now?" appears even if a formatted disc is loaded.

Replace the disc drive unit

Message "Write protected. Check disc" appears even if a disc with no write-protect is loaded.

Replace the disc drive unit.

Message "DISC ACCESS" does not disappear even if a normal disc is loaded.

Replace the disc drive unit.

4-6-2 Reassembly to enable service position

Cautions

1) The DZ-GX20A incorporates a high-voltage flash unit. Use countermeasures to prevent electric shock, such as wearing gloves, and take great care during work. The flash unit Keeps its high voltage even if the power supply (AC adapter/charger, battery, etc.) is removed.
2) Laser light striking the eye may cause your eyesight to be lost: For safety, be sure to remove any power supply (AC adapter/charger, battery, etc.) from the DVD video camera/recorder before starting work.

Information:
Numbers in the procedural diagram are step numbers of procedure; letters in brackets [ ] show the types of screw.

(1) Setting to service position (A)

Service position (A) is mainly used to diagnose trouble in the system of operation buttons on rear case, power supply system and video/audio signal system. Perform trouble diagnosis using the check points on MAN circuit board.

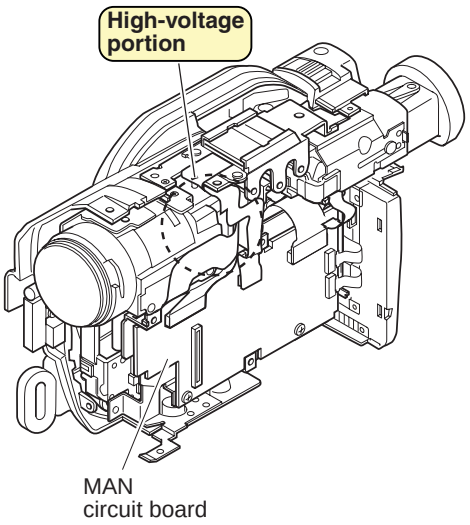


Fig. 4-6-1 Service Position (A)

1) Connect the two flat cables of rear block to the MAN circuit board (Fig. 4-6-2).
2) Attach the MAN circuit board and rear block to the R block.
3) Use the two screws [E] to secure the MAN circuit board.
4) Connect the GSL-H/GSL-L/GSL-M and MAN circuit boards.
5) Connect the DRF-H/DRF-L/DRF-M and MAN circuit boards.
6) Use the three screws [A] to secure the rear block.

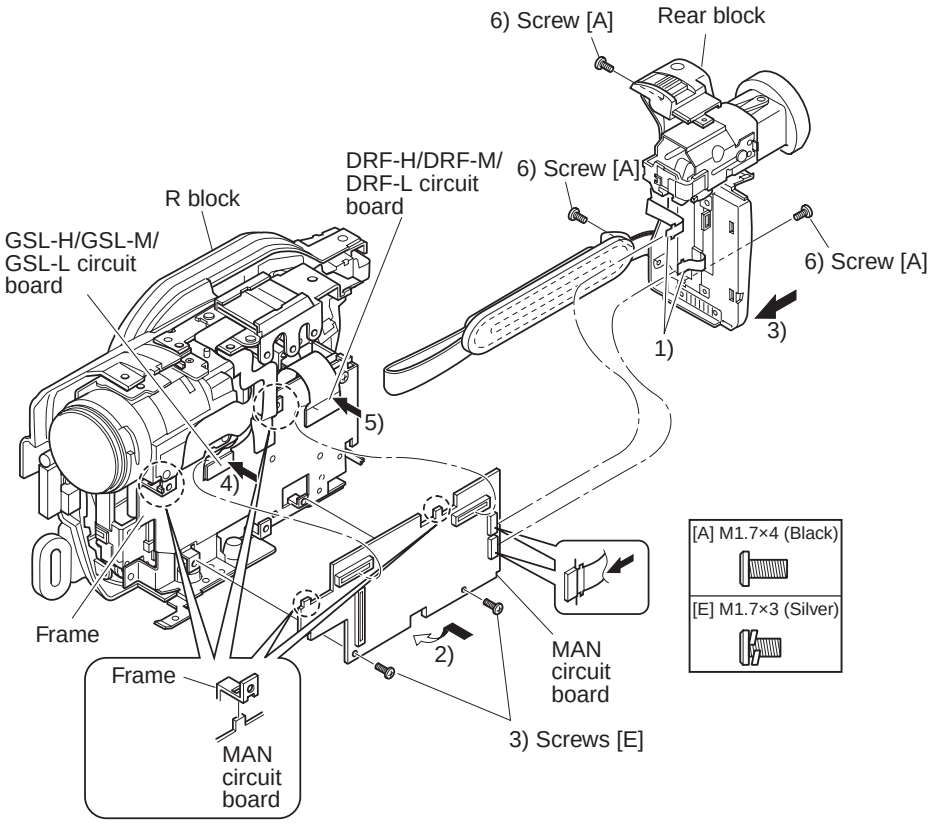


Fig. 4-6-2 Setting to Service Position (A)

(2) Setting to service position (B)

Service position (B) is used to diagnose trouble in the system of operation buttons on side case L.

Perform trouble diagnosis using the check points on MAN/MAN-M and AEL circuit boards.

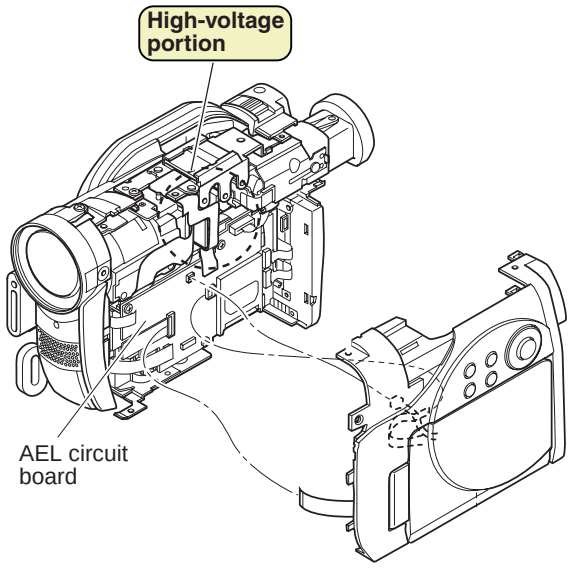


Fig. 4-6-3 Service Position (B)

Information:
The procedure for setting to service position (B) varies depending on the removed component: Perform steps from 1) after removing the MAN circuit board; perform only step 8) after removing the L block.

1) Attach the MAN circuit board and rear block to the R block, referring to "(1) Setting to service position (A) (Fig. 4-6-2)".
2) Attach the AEL circuit board to R block. Securely connect the AEL and MAN circuit boards at this time.
3) Use the three screws [E] to secure the AEL circuit board.
4) With DZ-GX20A/MV780A, connect the SHE-H/SHE-M circuit board to AEL circuit board. The SHE-H/SHE-M circuit board is not mounted in DZ-MV730A.
5) Connect the flat cable of EVF unit to the AEL circuit board.
6) Attach the front block to R block.
7) Connect the AVJ-H/AVJ-L/AVJ-M and FRT-H/FRT-L/FRT-M circuit boards to AEL circuit board.

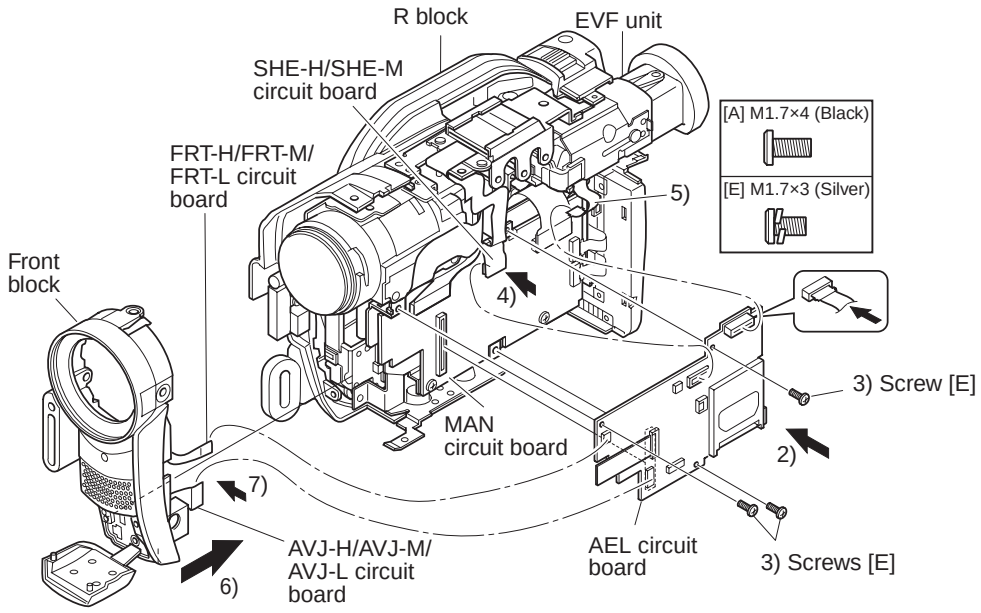


Fig. 4-6-4 Setting to Service Position (B) [1/2]

8) Connect the two flat cables on L block, and the connector of speaker cable, to the AEL circuit board (Fig. 4-6-5).

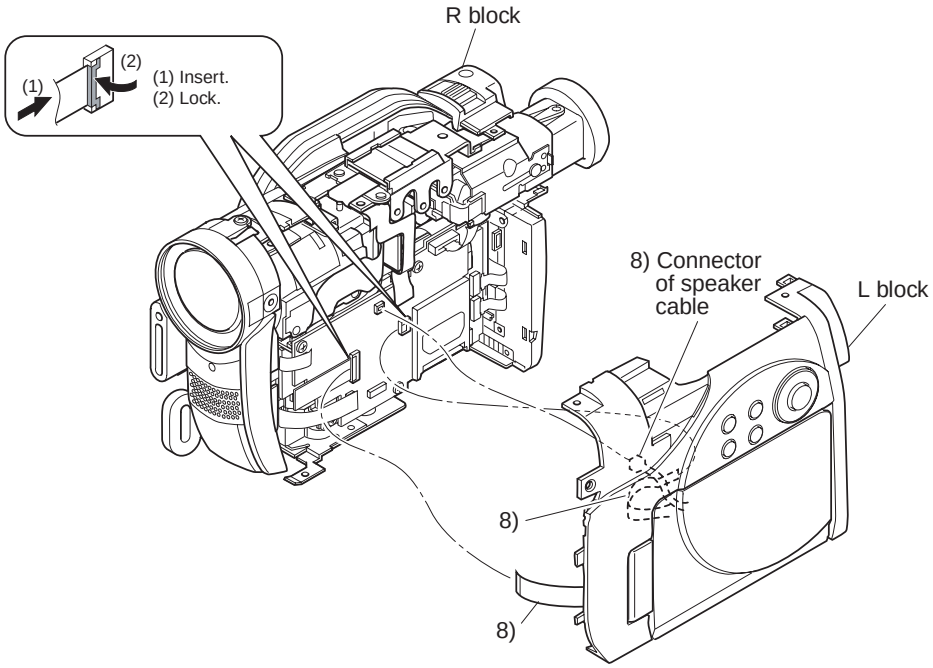


Fig. 4-6-5 Setting to Service Position (B) [2/2]

4-7 Procedure for Removing Disc from Faulty DVD Video Camera/Recorder

4-7-1 Item to be checked

Connect the AC adapter/charger or charged battery (power supply), make sure that the ACCESS indicator turns off, and then press the DISC EJECT button again.
Even with normal product, the disc cannot be removed while the ACCESS indicator is lit or blinking.

Information:
Be sure to connect the AC adapter/charger or charged battery pack (power supply) before pressing the DISC EJECT button.
The DISC EJECT button will not work unless a power supply is connected.

4-7-2 How to remove disc

If the disc cannot be removed after performing "4-7-1 Item to be checked", remove it using the procedure in this section.

Cautions
Laser light striking the eye may cause your eyesight to be lost: For safety, be sure to remove any power supply (AC adapter/charger, battery, etc.) from the DVD video camera/recorder before starting work.

Information:
1) The DZ-GX20A is used for explanation in this section. Although the shapes of parts are slightly different for each model, the procedure is identical for all models.
2) Numbers in the procedural diagram are step numbers of procedure, and letters in brackets [ ] show the types of screw.

1) Remove screw [B].
2) Remove the top cover in the direction of the arrow.
3) Use a fine-tipped flat-bladed screwdriver, etc. to move the lock slider in the direction of the arrow, and then open the disc cover.
4) After removing the disc, close the disc cover.
When reassembling the removed parts, use the reverse procedure to removal.

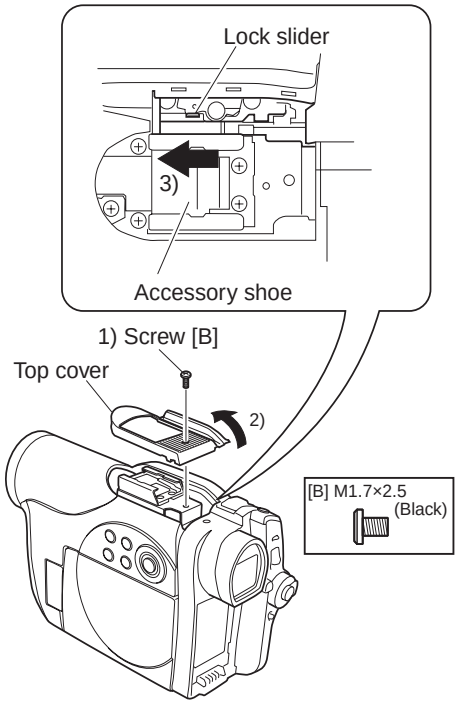


Fig. 4-7-1 How to remove disc

4-8 System Resetting/Resetting Camera Functions

The DVD video camera/recorder has two types of reset function: “System reset” and “Resetting camera functions”. The reset operation will return the various settings to the defaults when the DVD video camera/recorder was shipped form factory.

4-8-1 List of items to be reset

Table 4-8-1 shows the items that will be reset to defaults at the factory by the two types of reset operation: “system reset” and “resetting camera functions”. Check the settings of the received device.

Use the memo column in the table to enter the settings of any received device.

(1) Procedure for checking settings

1) Set the power switch to “OFF” and use a battery or the AC adapter/ charger to power the DVD video camera/recorder.
2) Insert a DVD-RAM, and then set the power switch to “VIDEO”. For subsequent steps, operate the DVD video camera/recorder while viewing the LCD monitor or viewfinder.
3) Press the MENU button to display the camera function setup screen: Make sure of the settings.
   Do not press the QUICK MENU button at this time: Pressing the QUICK MENU button will not allow you to check the settings.
4) Operate the ⏮ / ⏭ / ◀◀ / ▶▶ buttons to display the screens for the record function setup, date function setup, EVF/LCD setup and initial setup, in sequence, making sure of the settings.
   At this time, the items on photo quality, external photo input and self-timer will not appear, since they are related to photo recording: Check them in steps 6) and 7).
5) Set the power switch to “CARD PHOTO”. It is not necessary to insert a card at this time.
6) Press the MENU button to display the camera function setup screen, and then operate the ⏮ / ⏭ / ◀◀ / ▶▶ buttons to display the record function setup screen in order to check the settings on flash (DZ-GX20A only), photo quality, external photo input and self-timer.
7) After checking is complete, press the MENU button to restore the ordinary screen.

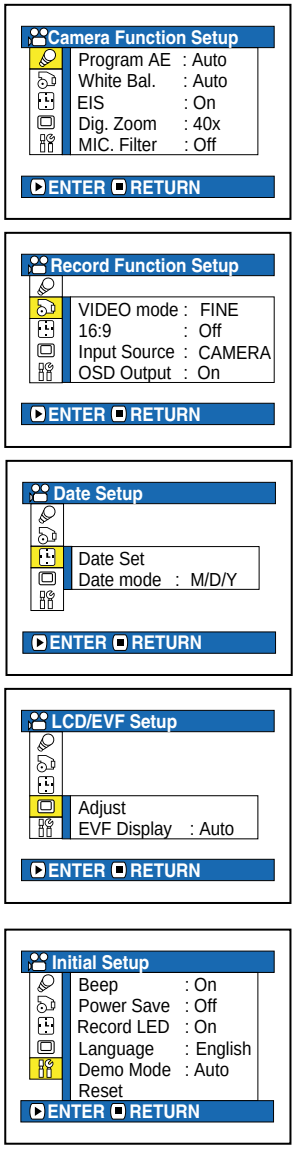


Fig. 4-8-1 Example of setup screens

Yes: Will be reset
No: Will not be reset

Table 4-8-1 List of items to be reset

Item	System reset	Camera function reset	Default at factory	Setting range	Remarks	Memo
Camera Functions Setup						
Program AE	Yes	Yes	Auto	Auto, Sports, Portrait, Spotlight, Sand & Snow, Low Light		
White Bal.	Yes	Yes	Auto	Auto, Set, Outdoor, Indoor 1, Indoor 2		
EIS	Yes	Yes	On	On, Off	Displayed only in the VIDEO mode. [Except for DZ-MV730A]	
Dig. Zoom	Yes	Yes	40×	240×, 40×, Off	Maximum 40x in PHOTO mode even if set to 240x.	
MIC Filter	Yes	Yes	Off	On, Off	Displayed only in the VIDEO mode.	
Flash	Yes	Yes	Auto	Auto, On, Off	Displayed only in the CARD PHOTO mode. [DZ-GX20A only]	
Record Functions Setup						
VIDEO Mode	Yes	Yes	FINE	XTRA, FINE, STD	Displayed only in the VIDEO mode.	
Quality	Yes	Yes	FINE	FINE, NORM, ECO	Displayed only in the CARD PHOTO mode	
16:9	Yes	Yes	Off	On, Off	Displayed only in the VIDEO mode.	
Input Source	Yes	Yes	CAMERA	CAMERA, LINE, S LINE	S LINE is not possible on DZ-MV730A.	
PHOTO Input	Yes	Yes	Field	Frame, Field	Displayed only in the PHOTO mode.	
Self Timer	Yes	Yes	Off	On, Off	Displayed only in the PHOTO mode.	
OSD Output	Yes	Yes	On	On, Off		
Date Setup						
Date Mode	Yes	Yes	M/D/Y	17:00 D/M/Y, 5:00PM M/D/Y, PM5:00 Y/M/D		
Date Set	Yes	No	1/1/2004 0:00	----------		

Item	System reset	Camera function reset	Default at factory	Setting range	Remarks	Memo
LCD/EVF Setup						
LCD Brightness	Yes	Yes	Center			
EVF Brightness	Yes	Yes	Center			
Color Level	Yes	Yes	Center			
EVF Display	Yes	Yes	Auto	Auto, On		
Initial Setup						
Beep	Yes	Yes	On	On, Off		
Power Save	Yes	Yes	Off	On, Off		
Record LED	Yes	Yes	On	On, Off		
Language	Yes	Yes	English	English, French, Spanish, German, Italian		
Demo Mode	Yes	Yes	Auto	Auto, Off, Start		

4-8-2 System reset procedure

Note:
Always perform system reset after completing repair: System reset will erase all error codes stored in flash memory.

1) Set the power switch to “OFF”, and then disconnect the battery or AC adapter/charger.
2) Use a fine tipped pen, etc. to hold down the RESET button for approx. 2 seconds.

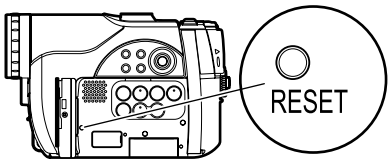


Fig 4-8-2 Reset switch position

4-8-3 Procedure for resetting camera functions

1) Connect a battery or AC adapter/charger to power the DVD video camera/recorder.
2) Set the power switch to “VIDEO”; loading disc is not necessary at this time. For the following steps, operate DVD video camera/recorder while viewing the LCD monitor or viewfinder.
3) Press the MENU button to display the camera function setup screen.
4) Use the ⏮ / ⏭ / ◀◀ / ▶▶ buttons to choose “Initial Setup”, and then press the ▶/II button.
5) Use the ⏮ / ⏭ / ◀◀ / ▶▶ buttons to choose “Reset”, and then press the ▶/II button: The screen for verifying reset will appear.
6) Use the ⏮ / ⏭ / ◀◀ / ▶▶ buttons to choose “YES”, and then press the ▶/II button: Reset will be executed.
7) After reset, press the MENU button to close the camera function setup screen.

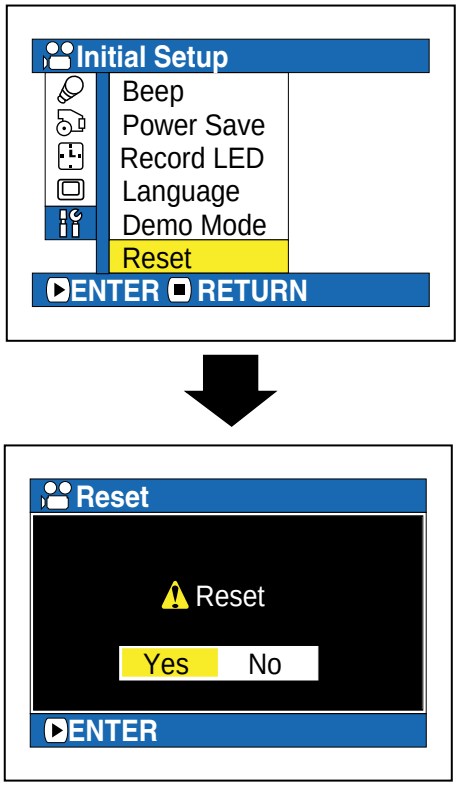


Fig 4-8-2 Example of reset screens

4-9 Special Functions

Restriction:
The information included in this section is exclusively for service personnel: Do not disclose it to persons other than service engineers.

4-9-1 Forced initialization of DVD-RAM

(1) Application/Symptom

Perform this procedure when Disc Navigation does not start normally and initialization is not possible with the procedure explained in instruction manual.

(2) Procedure

Note:
1) Initialization will delete all data on disc: Copy any necessary files to PC, etc.
2) Do not turn power off or remove the disc during initialization: Such an interruption will make the disc unusable.

1) Use the AC adapter/charger to power the DVD video camera/recorder, and set the power switch to “VIDEO” or “DISC PHOTO”.
   Do not use a battery for initializing disc: If power is interrupted during work, the disc could become unusable.
2) Make sure that the DVD-RAM to be initialized is free from dirt or scratch: If the disc is dirty or scratched, normal initialization may be impossible.
3) Insert the DVD-RAM to be initialized.
4) After the disc is recognized, operate the following buttons to display the disc formatting screen (Fig. 4-9-1):
   Hold down the SELECT, REC and + (plus) buttons simultaneously for at least 3 seconds.
5) Use the ⏮ / ⏭ / ◀◀ / ▶▶ buttons to choose “YES” and press the ▶/II button: Initialization will start and message “Formatting ...” will appear.
6) When formatting is complete, message “Finished” will appear for several seconds, and then the normal screen will automatically be restored.

Fig. 4-9-1 Screen for Disc Formatting

4-9-2 EEPROM data backup and write

(1) Application

Perform this work whenever you replace the MAN circuit board on which the EEPROM is mounted. Create a backup file of the data in EEPROM to be replaced in a PC, and write the backup file to new EEPROM: Some adjustment items that are performed after replacement can be omitted. Refer to "6-3-2 List of Adjustments Needed After Replacing Major Components" for adjustment items that can be omitted.

Information:
It may be impossible to back up the data in EEPROM to be replaced, depending on the status of fault: In such a case, replace the MAN circuit board, and then perform "6-4-1 Initial Data Write".

(2) Preparations

1) Open the LCD monitor. Insert a fine-tipped flat-bladed screwdriver into the groove in adjustment cover, and remove the cover from L case in the direction of the arrow: Be very careful not to scratch the cover or L case with screwdriver
2) Connect the DVD video camera/recorder, jig/tool and power supply as shown in Fig. 4-9-2. Refer to "6-1-1 List of Jigs and Tools used when Creating Reference Data" for details on jig/tool and power supply in the figure.
3) Copy the adjustment program to HDD of PC. Refer to "6-1-5 Copying or Deleting Adjustment Program" for copying.
4) Start the adjustment program in order to display the adjustment menu screen on PC display. Refer to "6-2-6 Starting and Terminating Adjustment Program" for how to start the program.

Caution
It is very dangerous to perform any work with the DVD video camera/recorder disassembled, since the DVD video camera/recorder has a laser-emitting block and high-voltage circuits: Do not remove any parts other than the adjustment cover.

Note:
Always connect the Halcyon connector before connecting the DC power cord to the DVD video camera/recorder: Connecting the Halcyon connector after powering the DVD video camera/recorder could cause a fault.

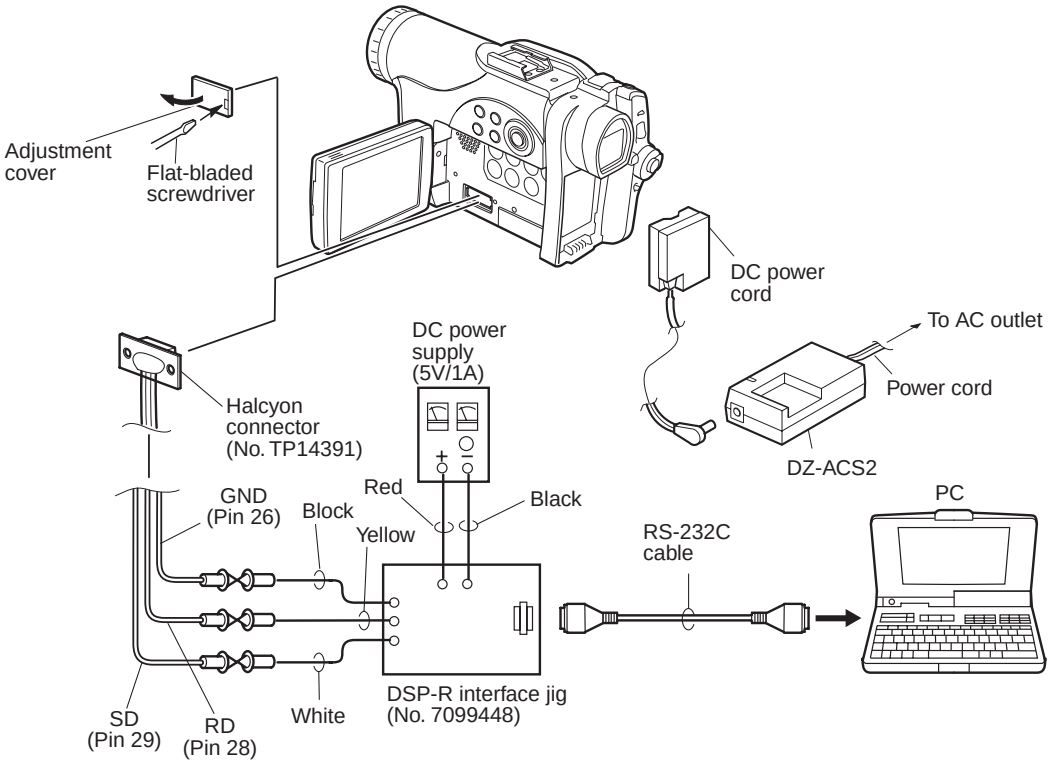
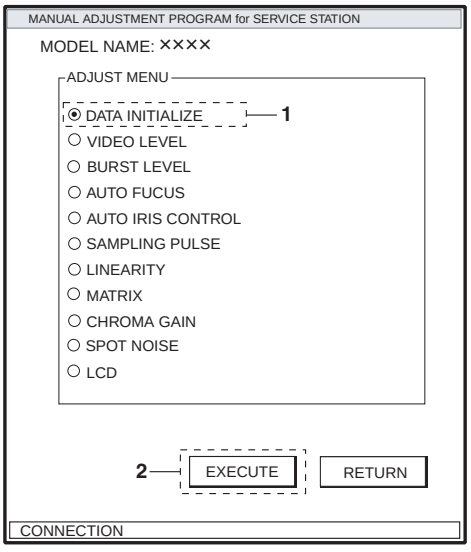


Fig. 4-9-2 Connections when creating backup file of EEPROM data and writing

(3) Backup method

1) Choose DATA INITIALIZE on the ADJUST MENU screen.
2) Click the EXECUTE button on ADJUST MENU screen to proceed with the DATA INITIALIZE MENU screen.

ADJUST MENU screen

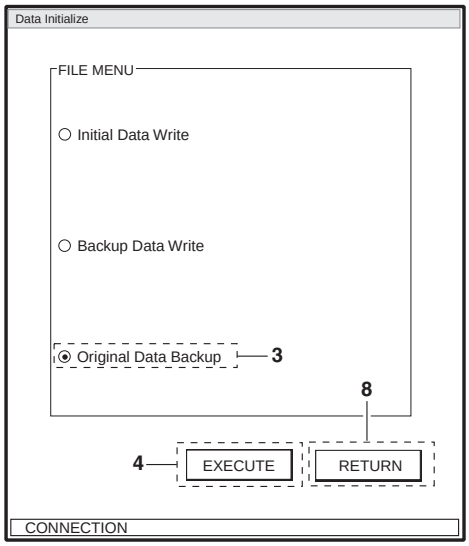


3) Choose Original Data Backup on the DATA INITIALIZE MENU screen.

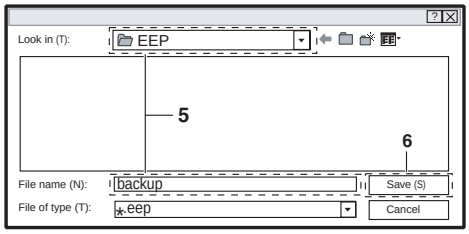
Note:
Do not choose “Initial Data Write” on the DATA INITIALIZE MENU.
Refer to “6-4-1 Initial Data Write” after backup for “Initial Data Write”.

4) Click the EXECUTE button on DATA INITIALIZE MENU screen to proceed with the BACKUP FILE SELECT screen.
5) From the BACKUP FILE SELECT screen, select or set the names of folder and file in which the data is stored. This section refers to the folder and file as “EEP” and “backup.eep” for explanation: Freely select and set easy-to-understand names.
6) Click the SAVE button on BACKUP FILE SELECT screen to start backup.
   The progress status can be confirmed using the PROGRESS STATUS dialog.
7) When backup is complete, the BACKUP FINISHED dialog will appear: Click the OK button in dialog to restore the DATA INITIALIZE MENU screen.
8) Then click the RETURN buttons on each menu screen to restore the MODEL SELECT screen, and click the EXIT button on MODEL SELECT screen to exit the adjustment program.
9) Disconnect the DVD video camera/recorder, jig/tool and power supply, and then replace the MAN circuit board.

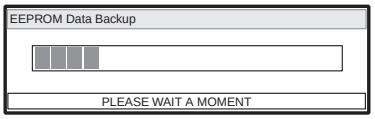
DATA INITIALIZE MENU screen



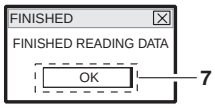
BACKUP FILE SELECT screen



PROGRESS STATUS dialog



BACKUP FINISHED dialog

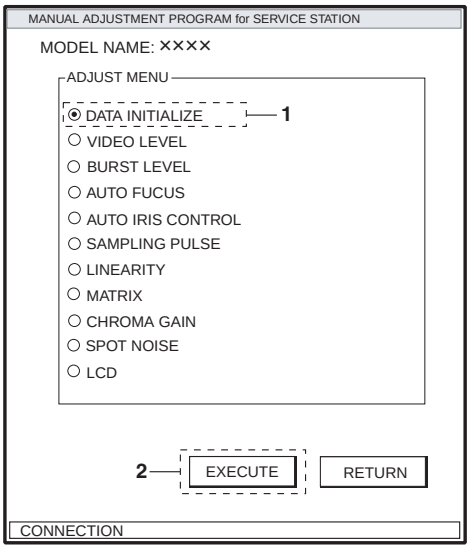


(4) Write method

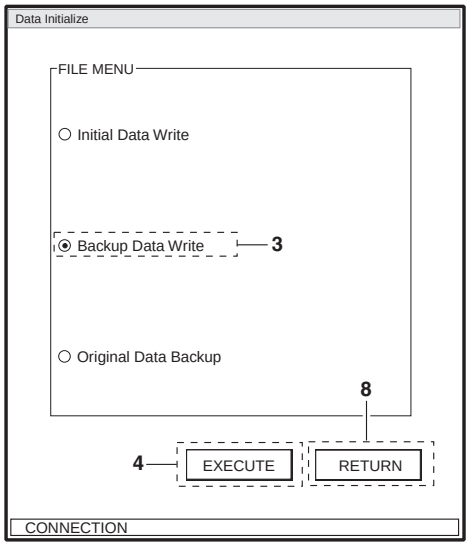
Restrictions:
Never write data of any other product.
The EEPROM data includes adjustment values, etc. that are peculiar to that product: It is different for each product even if the model is the same.
If you write the data of another product by mistake, rewrite the correct data.

1) Choose DATA INITIALIZE on the ADJUST MENU screen.
2) Click the EXECUTE button on ADJUST MENU screen to proceed with the DATA INITIALIZE MENU screen.
3) Choose Backup Data Write on the DATA INITIALIZE MENU screen.
4) Click the EXECUTE button on DATA INITIALIZE MENU screen to proceed with the WRITE FILE SELECT screen.
5) From WRITE FILE SELECT screen, select the folder and file in which the data has previously been backed up.
   This section refers to the folder and file as “EEP” and “backup.eep” for explanation.
6) Click the OPEN button on WRITE FILE SELECT screen to start writing.
   The progress status can be confirmed using the PROGRESS STATUS dialog.
7) When writing is complete, the INITIALIZATION FINISHED dialog will appear: Click the OK button in dialog to restore the DATA INITIALIZE MENU screen.
8) Click the RETURN button on DATA INITIALIZE MENU screen to restore the ADJUST MENU screen, and then perform adjustment according to “6-3-2 List of Adjustments Needed After Replacing Major Components”.

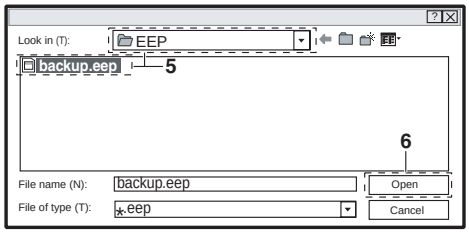
ADJUST MENU screen



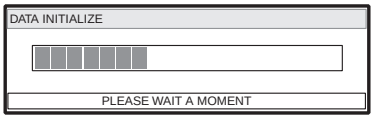
DATA INITIALIZE MENU screen



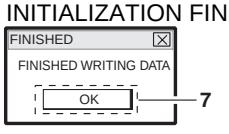
WRITE FILE SELECT screen



PROGRESS STATUS dialog



INITIALIZATION FINISHED dialog



5 Disassembly and Reassembly

Caution

Since the DZ-GX20A incorporates high-voltage circuits, take electric charge prevention measures, such as wearing gloves, and take great care when performing work.

5-1 Items to Be Checked

(1) Checking Disc

Connect the AC adapter/charger or charged battery (power supply), and then press the DISC EJECT button to make sure that no disc is loaded. After checking, close the disc insertion block. If the disc insertion block does not open normally, use the same procedure as in "5-3 (4) Removing cushion F and cushion R" to open the disc insertion block; make sure that no disc is loaded.

(2) Checking Card

Make sure that no card is loaded in the card slot, and then, close the card slot cover.

Caution

Laser light striking the eye may cause your eyesight to be lost: For safety, be sure to remove any power supply (AC adapter/charger, battery, etc.) from the DVD video camera/recorder before starting work.

5-2 Order of Disassembly

1) Refer to the disassembly flowcharts in Figs. 5-2-1 and 5-2-2 for the order of removing each component. The disassembly flowcharts are different for each model: Be sure to follow the disassembly flowchart for the corresponding model.
   Unless otherwise specified, use the reverse procedure to reassemble the removed components.
2) When replacing the MAN circuit board, it is recommended that you back up the EEPROM data in advance, referring to "4-9-2 EEPROM data backup and write"; write the EEPROM data after replacing the MAN circuit board.
3) After replacing any circuit boards and any units, perform any necessary adjustments according to "6-3-2 List of adjustments needed after replacing major components".

Note:
When replacing components, be sure to use only those shown in "Replacement Parts List".

Reading Disassembly Flowchart:

After locating the target component in the flowchart, remove all components in sequence until the target is reached, following the arrows (routes) from the top left of flowchart. If multiple routes exist to the target component from the top of flowchart, remove all the components on all the routes.

DZ-GX20A/MV730A

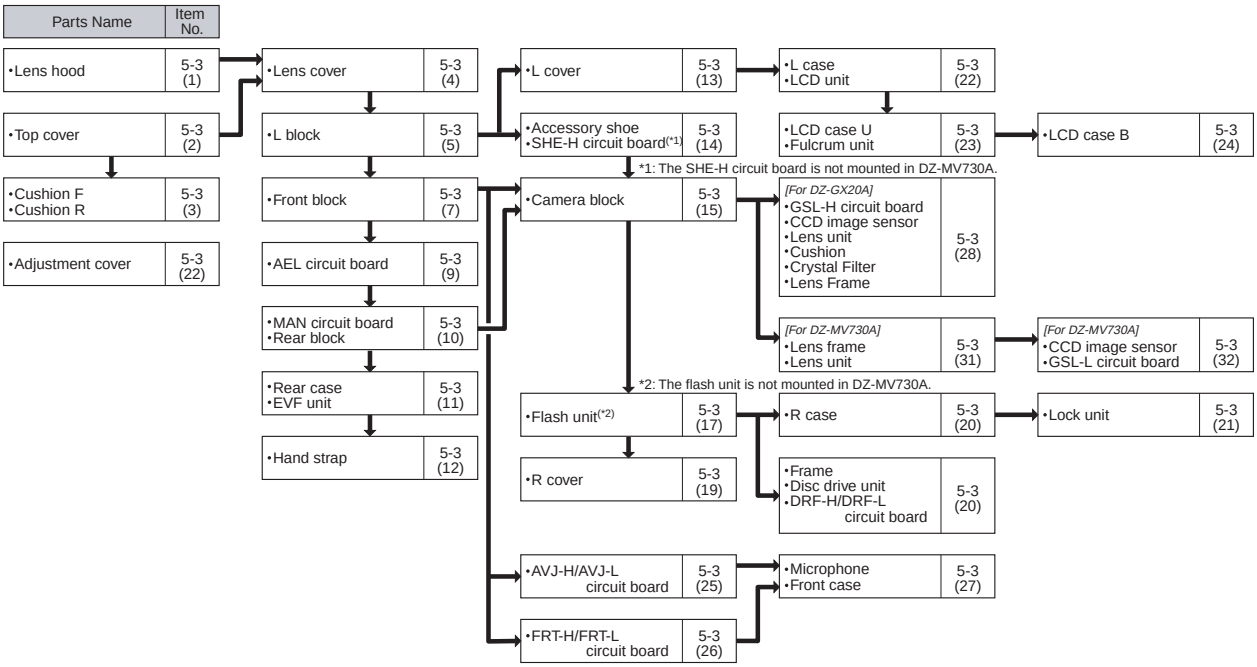

Parts Name
Item No.
•Lens hood 5-3 (1)
•Top cover 5-3 (2)
•Cushion F •Cushion R 5-3 (3)
•Adjustment cover 5-3 (22)
•Lens cover 5-3 (4)
•L block 5-3 (5)
•Front block 5-3 (7)
•AEL circuit board 5-3 (9)
•MAN circuit board •Rear block 5-3 (10)
•Rear case •EVF unit 5-3 (11)
•Hand strap 5-3 (12)
•L cover 5-3 (13)
•Accessory shoe •SHE-H circuit board(*1) 5-3 (14)
•Camera block 5-3 (15)
•Flash unit(*2) 5-3 (17)
•R cover 5-3 (19)
•AVJ-H/AVJ-L circuit board 5-3 (25)
•FRT-H/FRT-L circuit board 5-3 (26)
•L case •LCD unit 5-3 (22)
•LCD case U •Fulcrum unit 5-3 (23)
•LCD case B 5-3 (24)
*1: The SHE-H circuit board is not mounted in DZ-MV730A.
[For DZ-GX20A] •GSL-H circuit board •CCD image sensor •Lens unit •Cushion •Crystal Filter •Lens Frame 5-3 (28)
[For DZ-MV730A] •Lens frame •Lens unit 5-3 (31)
[For DZ-MV730A] •CCD image sensor •GSL-L circuit board 5-3 (32)
*2: The flash unit is not mounted in DZ-MV730A.
•R case 5-3 (20)
•Lock unit 5-3 (21)
•Frame •Disc drive unit •DRF-H/DRF-L circuit board 5-3 (20)
•Microphone •Front case 5-3 (27)

Fig. 5-2-1 DZ-GX20A/MV730A Disassembly Flowchart

DZ-MV780A

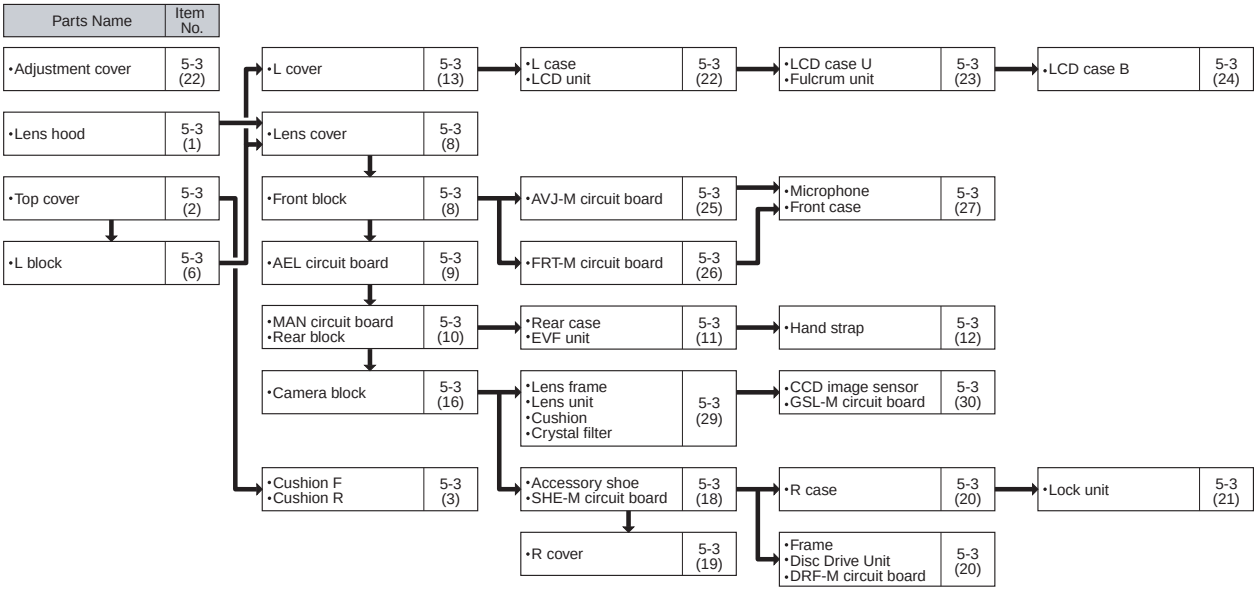

Parts Name
Item No.
•Adjustment cover 5-3 (22)
•Lens hood 5-3 (1)
•Top cover 5-3 (2)
•L block 5-3 (6)
•L cover 5-3 (13)
•Lens cover 5-3 (8)
•Front block 5-3 (8)
•AEL circuit board 5-3 (9)
•MAN circuit board •Rear block 5-3 (10)
•Camera block 5-3 (16)
•Cushion F •Cushion R 5-3 (3)
•L case •LCD unit 5-3 (22)
•AVJ-M circuit board 5-3 (25)
•FRT-M circuit board 5-3 (26)
•Rear case •EVF unit 5-3 (11)
•Lens frame •Lens unit •Cushion •Crystal filter 5-3 (29)
•Accessory shoe •SHE-M circuit board 5-3 (18)
•R cover 5-3 (19)
•LCD case U •Fulcrum unit 5-3 (23)
•LCD case B 5-3 (24)
•Microphone •Front case 5-3 (27)
•Hand strap 5-3 (12)
•CCD image sensor •GSL-M circuit board 5-3 (30)
•R case 5-3 (20)
•Lock unit 5-3 (21)
•Frame •Disc Drive Unit •DRF-M circuit board 5-3 (20)

Fig. 5-2-2 DZ-MV780A Disassembly Flowchart

5-3 Disassembly

Information:
1) Even if the shapes of parts are different, the following disassembly procedure, using the DZ-GX20A, is the same for all models.
2) Numbers in the disassembly procedure diagrams are step numbers of disassembly procedures, and letters in brackets [ ] show the types of screw.

(1) Lens Hood [DZ-GX20A/MV780A/MV730A]

1) Turn the lens hood (a) in the direction of the arrow to remove it.

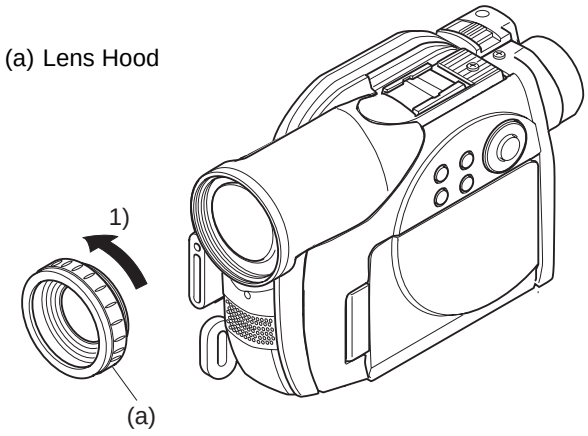


Fig. 5-3-1

(2) Top Cover [DZ-GX20A/MV780A/MV730A]

1) Remove the screw [B].
2) Remove the top cover (a) in the direction of the arrow.

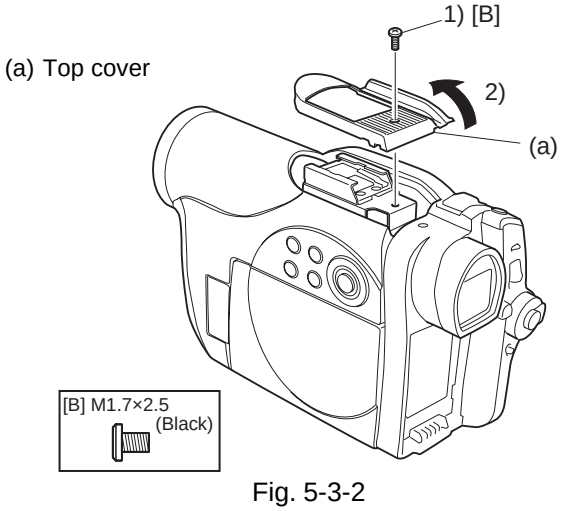


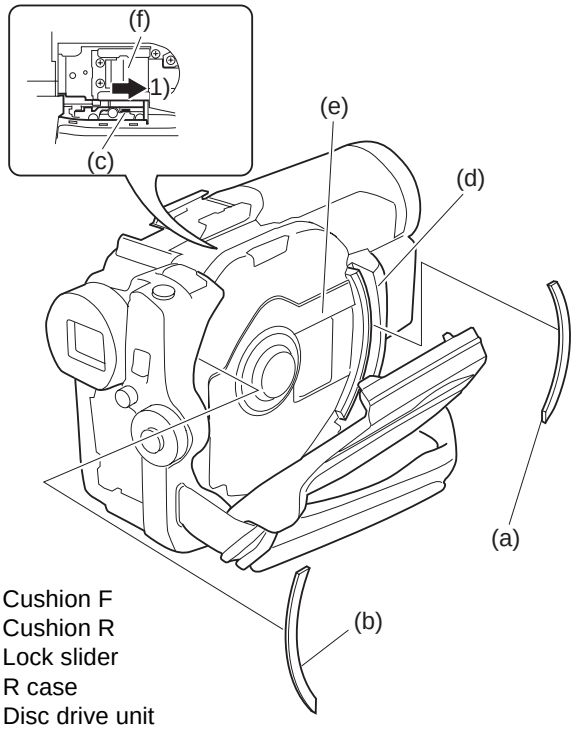
Fig. 5-3-2

(3) Cushion F and Cushion R [DZ-GX20A/MV780A/MV730A]

Information:
1) Replace cushion F and cushion R only if they are damaged or deteriorate.
2) Cushions F and R are attached to the R case that is a service part.

1) Move the lock slider (c) in the direction of the arrow to open the disc insertion block.
2) Use tweezers, etc. to remove cushions F (a) and R (b) from the R case (d), taking care not to scratch the R case or disc drive unit (e).

Cautions during disassembly and reassembly:
1) Make sure that there is no dust or remaining cushioning material on the R case.
2) When replacing cushions F and R, always use brand-new cushions.



(a) Cushion F
(b) Cushion R
(c) Lock slider
(d) R case
(e) Disc drive unit
(f) Accessory shoe

Fig. 5-3-3

(4) Lens Cover [DZ-GX20A/MV730A]

1) Remove the screw [B].
2) Remove the lens cover (a) in the direction of the arrow.

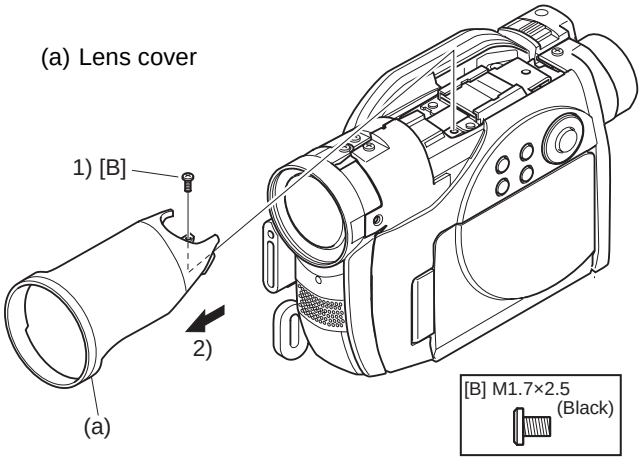
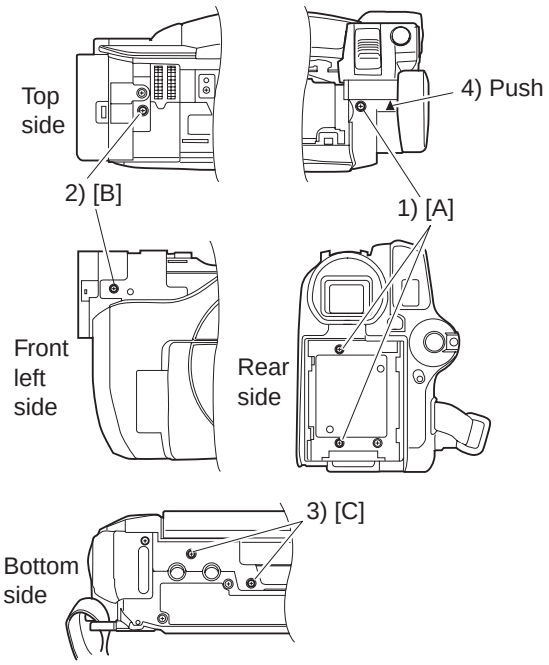


Fig. 5-3-4

(5) L Block [DZ-GX20A/MV730A]

1) Remove the three screws [A].
2) Remove the two screws [B].
3) Remove the two screws [C].
4) While pushing the upper part of EVF unit on the L case, open the L block (a) in the direction of the arrow, making sure that the two flat cables and the other two cables (speaker cables) between the L block and R block (b) are not disconnected.
5) Unplug the connector of speaker cables (c).
6) Disconnect the two flat cables.

Caution during disassembly and reassembly:
Securely plug in the connector of speaker cable and connect the two flat cables.



Detailed view of screw positions

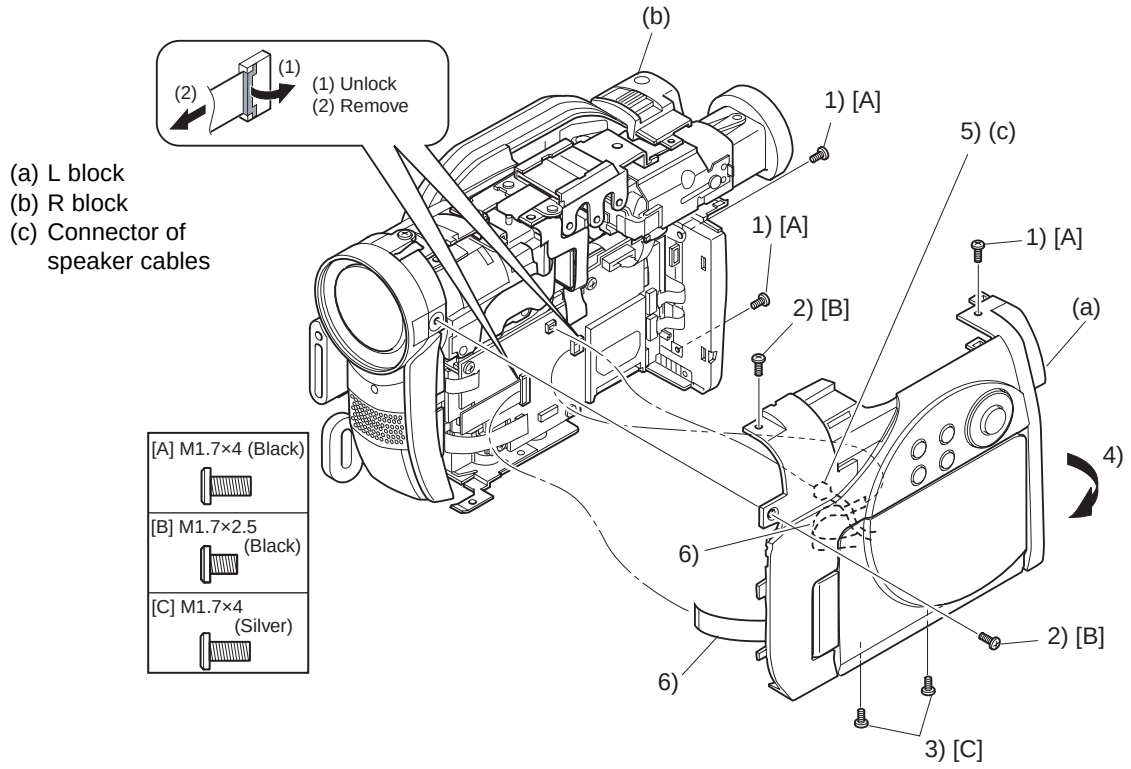
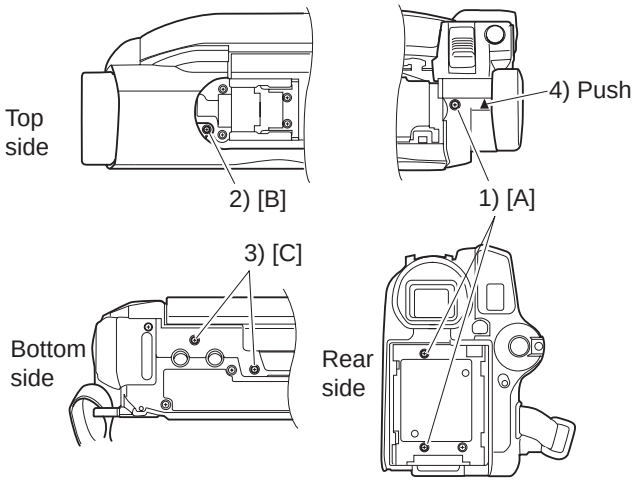


Fig. 5-3-5

(6) L Block [DZ-MV780A]

1) Remove the three screws [A].
2) Remove the screw [B].
3) Remove the two screws [C].
4) While pushing the upper part of EVF unit on the L case, open the L block (a) in the direction of the arrow, making sure that the two flat cables and the other two cables (speaker cables) between the L block and R block (b) are not disconnected.
5) Unplug the connector of speaker cable (c).
6) Disconnect the two flat cables.

Caution during disassembly and reassembly:
Securely plug in the connector of speaker cable and connect the two flat cables.



Detailed view of screw positions

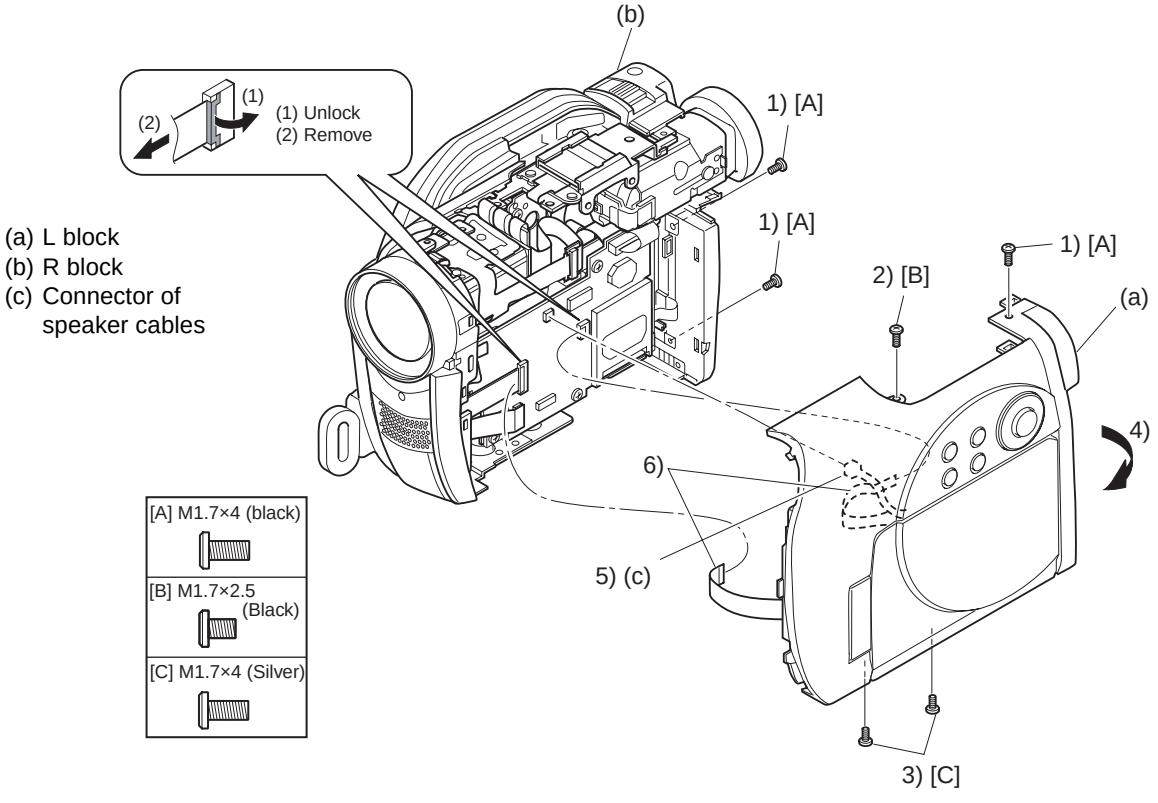
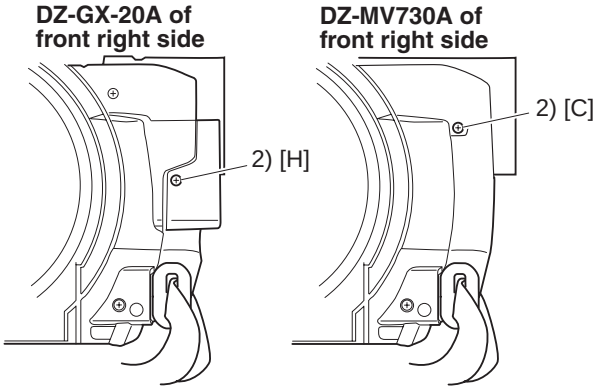


Fig. 5-3-6

(7) Front Block [DZ-GX20A/MV730A]

1) Open the jack cover (b), and then remove the three screws [A].
2) With DZ-GX20A, remove the screw [H].
   With DZ-MV730A, remove the screw [C].
3) Remove the FRT-H/FRT-L circuit board (c) from AEL (e) circuit board in the direction of the arrow.
4) Remove the AVJ-H/AVJ-L circuit board (d) from AEL (e) circuit board in the direction of the arrow.
5) Remove the front block (a) in the direction of the arrow.



Front right side

(a) Front cover
(b) Jack cover
(c) FRT-H/FRT-L circuit board
(d) AVJ-H/AVJ-L circuit board
(e) AEL circuit board

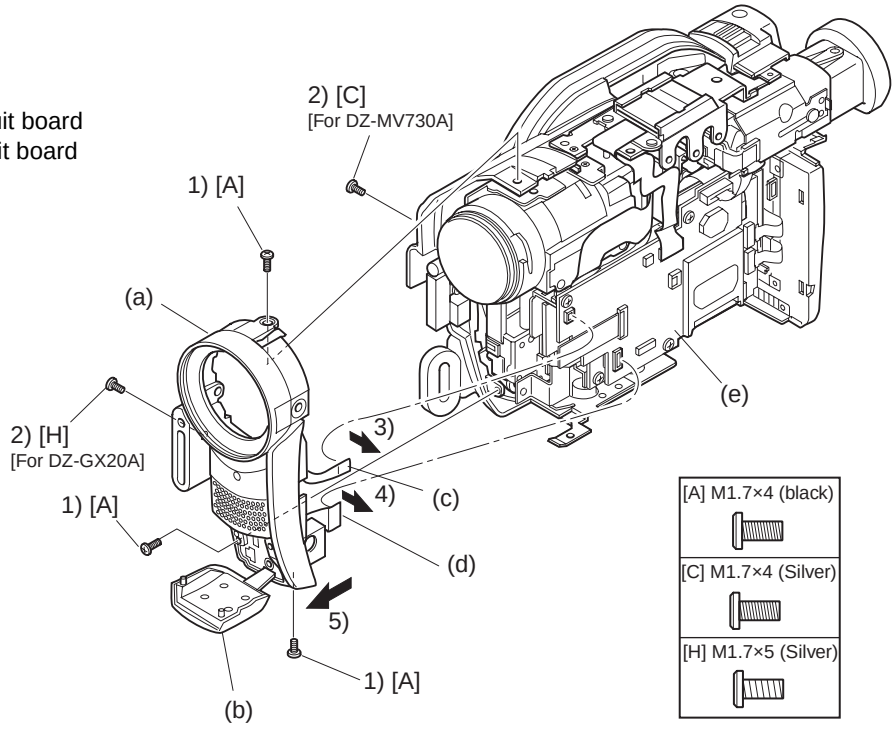


Fig. 5-3-7

(8) Lens Cover and Front Case [DZ-MV780A]

1) Remove the screw [L].
2) Remove the lens cover (a) in the direction of the arrow. Do not tilt the lens cover when removing the lens cover: Doing so could damage its claw.
3) Open the jack cover (c), and then remove the screw [A] and screw [L].
4) Remove the screw [C].
5) Remove the FRT-M circuit board (d) from AEL circuit board (e) in the direction of the arrow.
6) Remove the AVJ-M circuit board (e) from AEL circuit board in the direction of the arrow.
7) Remove the front block in the direction of the arrow.

(a) Lens cover
(b) Front cover
(c) Jack cover
(d) FRT-M circuit board
(e) AVJ-M circuit board
(f) AEL circuit board

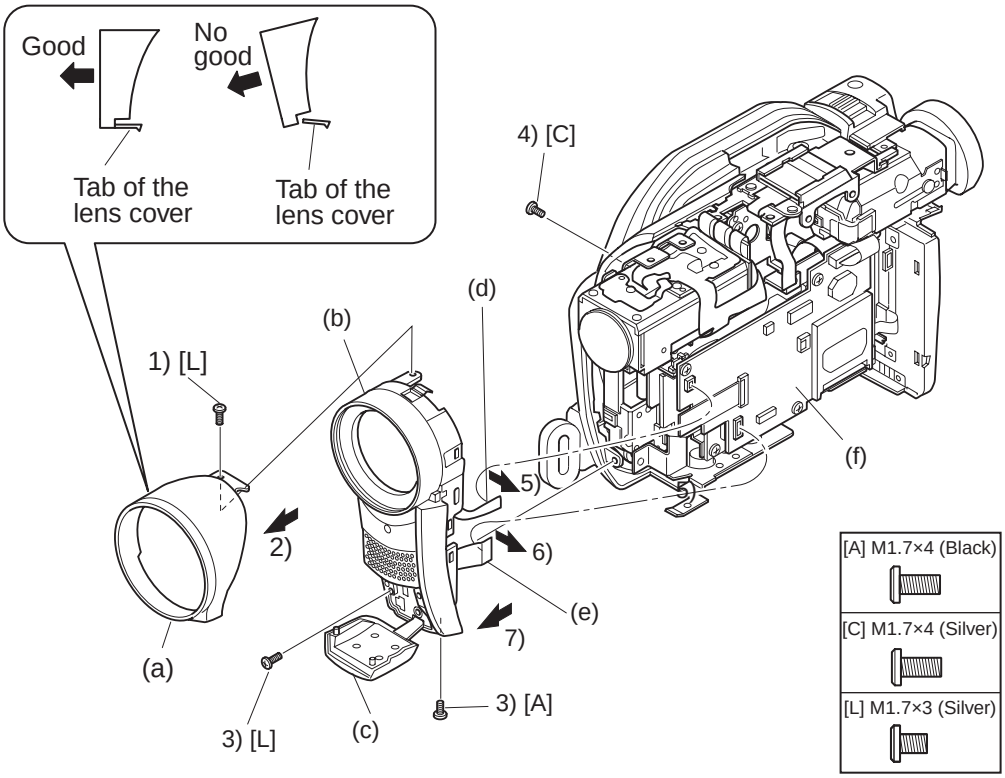


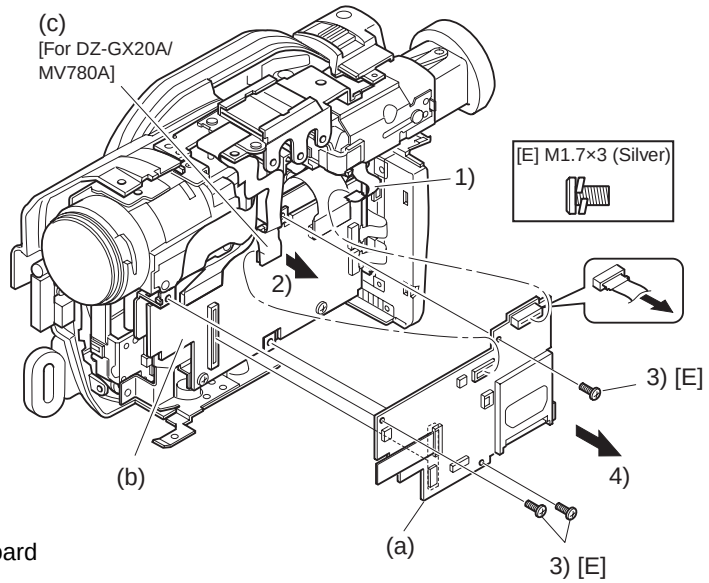
Fig. 5-3-8

(9) AEL Circuit Board [DZ-GX20A/MV780A/MV730A]

1) Disconnect the flat cable.
2) With DZ-GX20A/MV780A, remove the SHE-H/SHE-M circuit board (c) from AEL circuit board in the direction of the arrow. The SHE-H/SHE-M circuit board is not mounted in DZ-MV730A.
3) Remove the three screws [E].
4) Remove the AEL circuit board (a) from the MAN circuit board (b) in the direction of the arrow. The AEL and MAN circuit boards are directly joined via the connector: Removing the AEL circuit board in a direction other than that of the arrow could damage the connector.

Caution during disassembly and reassembly:

Securely connect the AEL and MAN circuit boards.



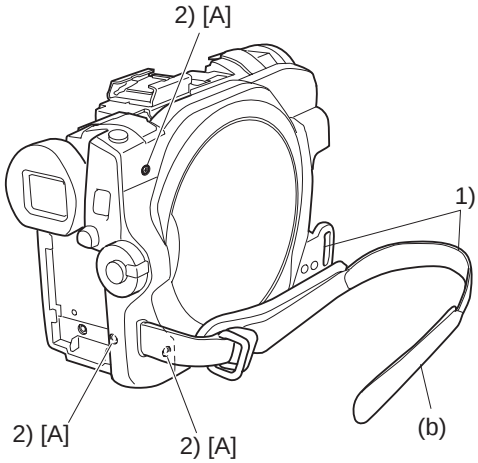
(a) AEL circuit board
(b) MAN circuit board
(c) SHE-H/SHE-M circuit board

Fig. 5-3-9

(10) MAN Circuit Board and Rear Block [DZ-GX20A/MV780A/MV730A]

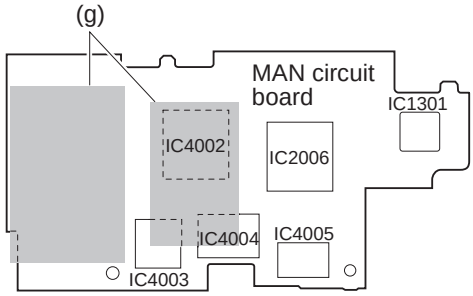
Information:
Before replacing the MAN circuit board, refer to "4-9-2 EEPROM data backup and write".

1) Remove the hand strap (c) from R case (d).
2) Remove the three screws [A].
3) Remove the DRF-H/DRF-L/DRF-M circuit board (e) from MAN circuit board (a) in the direction of the arrow.]
4) Remove the GSL-H/GSL-L/GSL-M circuit board (f) from MAN circuit board in the direction of the arrow.
5) Remove the two screws [E].
6) Remove the MAN circuit board (a) and rear block (b) separately in the directions of the arrows: It may be difficult to remove the MAN circuit board, since the heat sink rubbers (g) of board will stick to the frame.
7) Disconnect the two flat cables.



Right side

Note:
Do not scratch the surface of IC4003, which is a silicone substrate (silicone wafer) made of semiconductor: Scratching it could cause a fault.



Positions of heat sink rubbers and IC4003

Caution during disassembly and reassembly:
Be sure to paste the two heat sink rubbers to the MAN circuit board: Neglecting this could cause a fault.

(a) MAN circuit board
(b) Rear block
(c) hand strap
(d) R case
(e) DRF-H/DRF-M/DRF-L circuit board
(f) GSL-H/GSL-M/GSL-L circuit board
(g) Heat sink rubbers
(h) Frame

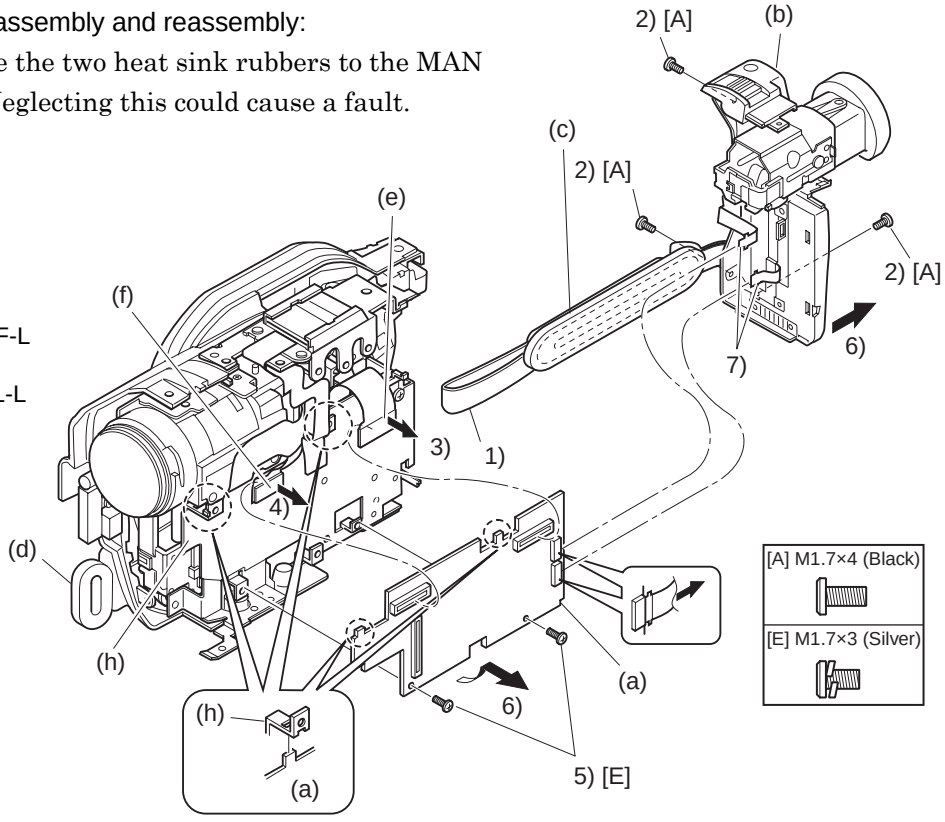


Fig. 5-3-10

(11) Rear Case and EVF Unit [DZ-GX20A/MV780A/MV730A]

1) Pull out the EVF unit in the direction of the arrow.
2) Remove the eye cup in the direction of the arrow.
3) Remove the screw [A].

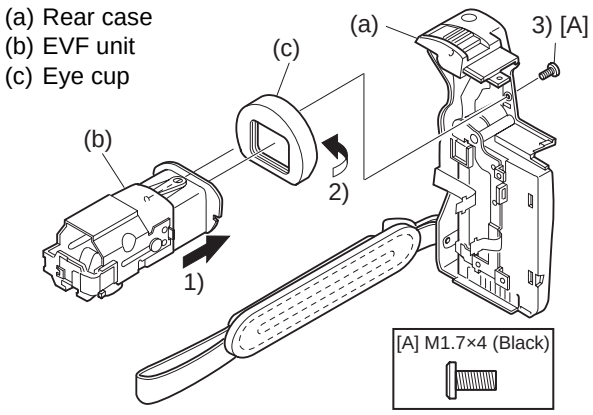


Fig. 5-3-11

(12) Hand Strap [DZ-GX20A/MV780A/MV730A]

1) Remove the two screws [F].
2) Remove the screw [F], taking care because the spring (c) of battery release button (b) may pop out.
3) Remove the hand strap (a) in the direction of the arrow, and then pull out the pin (d).

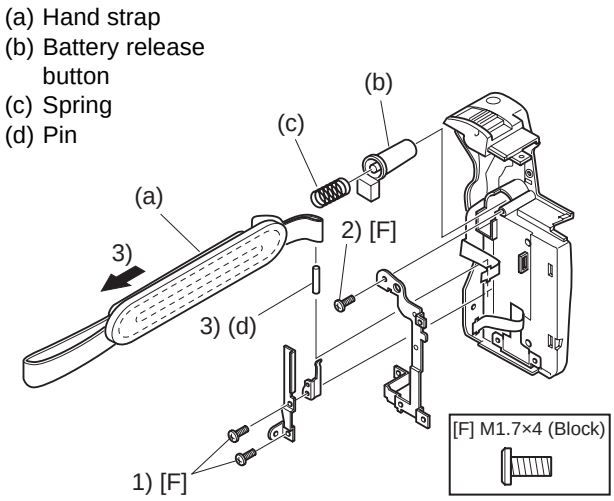


Fig. 5-3-12

(13) L Cover [DZ-GX20A/MV780A/MV730A]

1) Remove the five screws [F].
2) Release the tab, and then remove the L case (b) in the direction of the arrow.

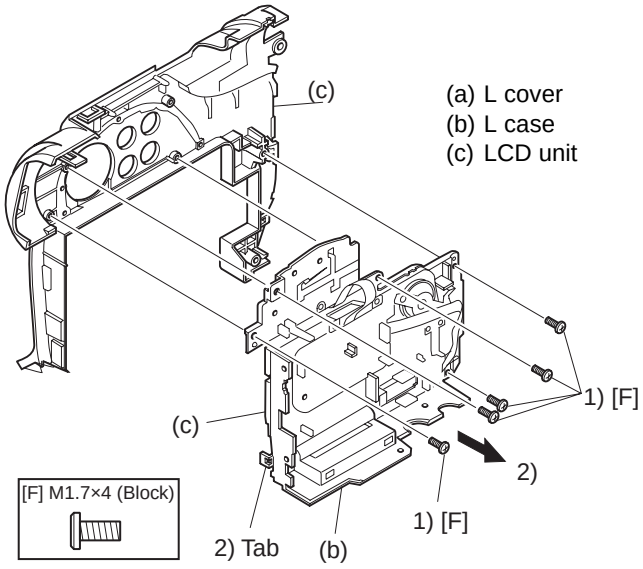


Fig. 5-3-13

(14) Accessory Shoe and SHE-H circuit board [DZ-GX20A/MV730A]

Information:
The SHE-H circuit board is not mounted in DZ-MV730A.

1) With DZ-GX20A, remove the SHE-H circuit board (b) from AEL circuit board (c) in the direction of the arrow.
2) With DZ-GX20A, remove the SHE-H circuit board from the circuit board block of flash unit (d) in the direction of the arrow.
3) Remove the screw [B].
4) Remove the screw [A].
5) Remove the screw accessory shoe (a) together with SHE-H circuit board in the direction of the arrow.
6) With DZ-GX20A, remove the SHE-H circuit board from the accessory shoe in the direction of the arrow.

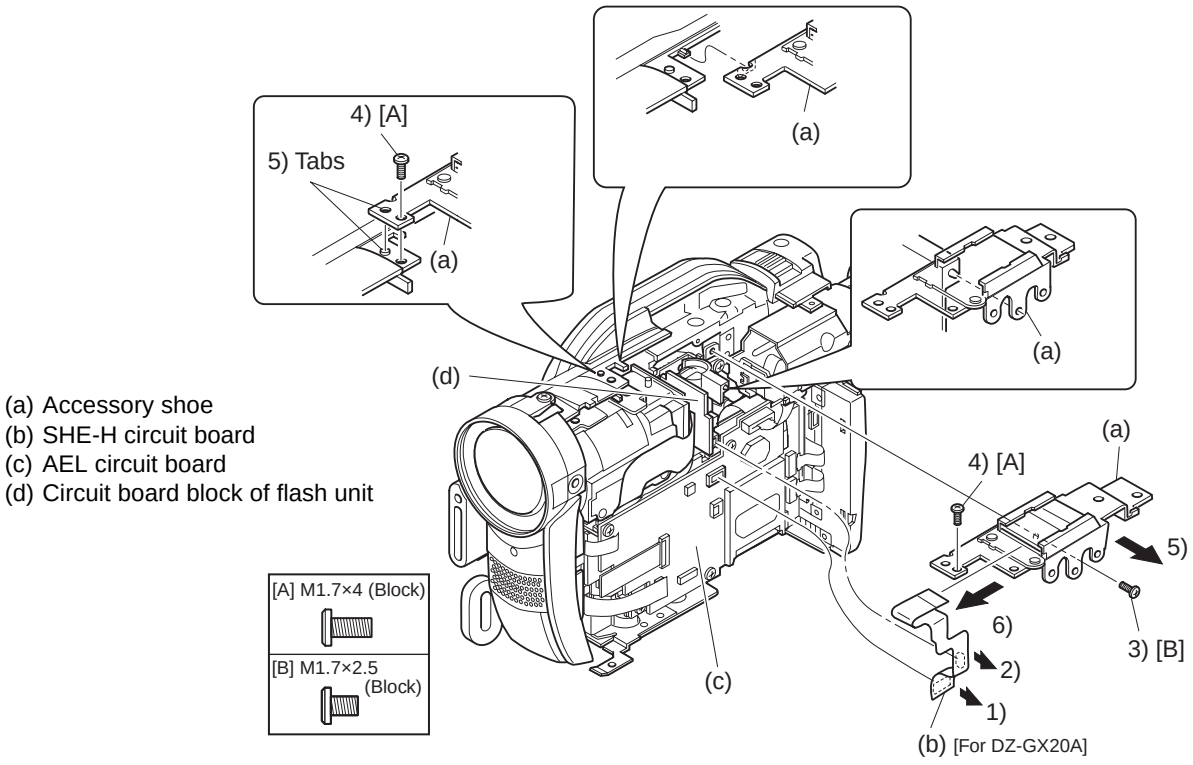


Fig. 5-3-14

(15) Camera Block [DZ-GX20A/MV730A]

1) Remove the screw [B].
2) With DZ-GX20A, remove the screw [C].

Note:
Take great care when handling the camera block: The camera block contains the lens unit, which is a precision component. Subjecting the lens unit to any impact, however slight, could result in a fault.

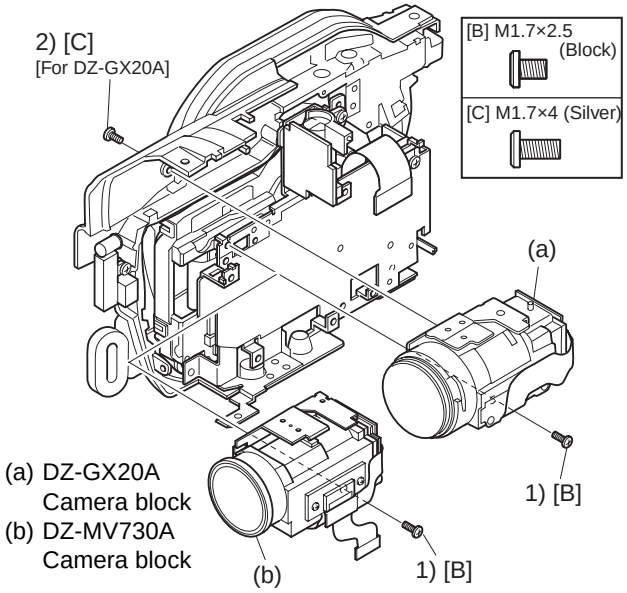


Fig. 5-3-15

(16) Camera Block [DZ-MV780A]

1) Remove the screw [B].

Note:
Take great care when handling the camera block: The camera block contains the lens unit, which is a precision component. Subjecting the lens unit to any impact, however slight, could result in a fault.

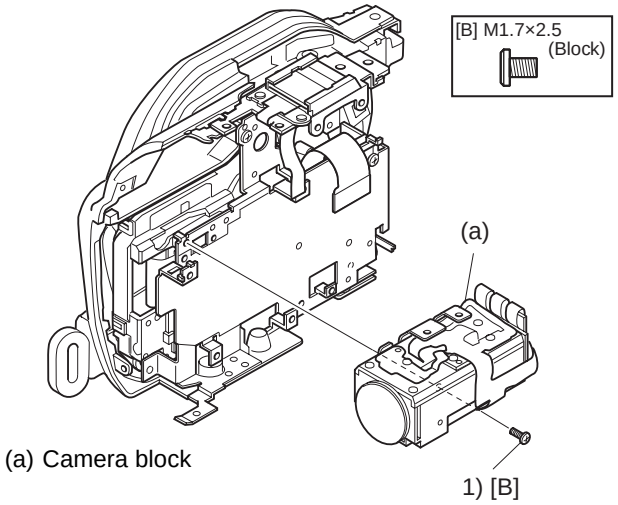


Fig. 5-3-16

(17) Flash Unit [DZ-GX20A]

Caution

Since the flash unit incorporates high-voltage circuits, take electric charge prevention measures, such as wearing gloves, and take great care when performing work.

Information:

The flash unit is a component with the flash and circuit board blocks connected.

1) Remove the screw [A], and then remove the flash block.
2) Remove the screw [F], and then remove the circuit board block.

Caution during disassembly and reassembly:

Secure the cables of flash unit (between the flash and circuit board blocks) as shown in the figure.

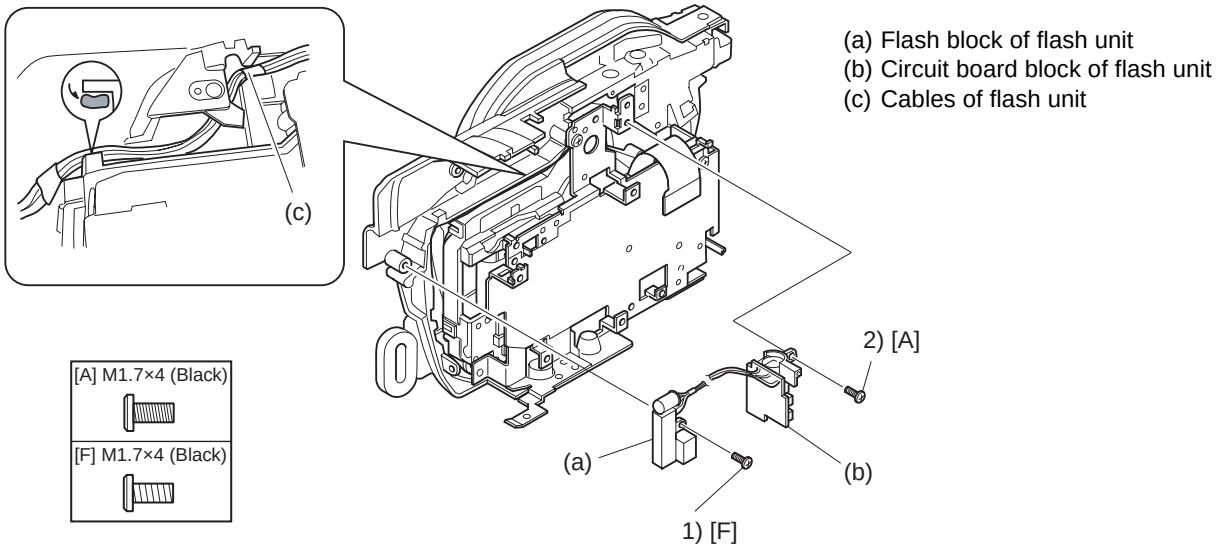
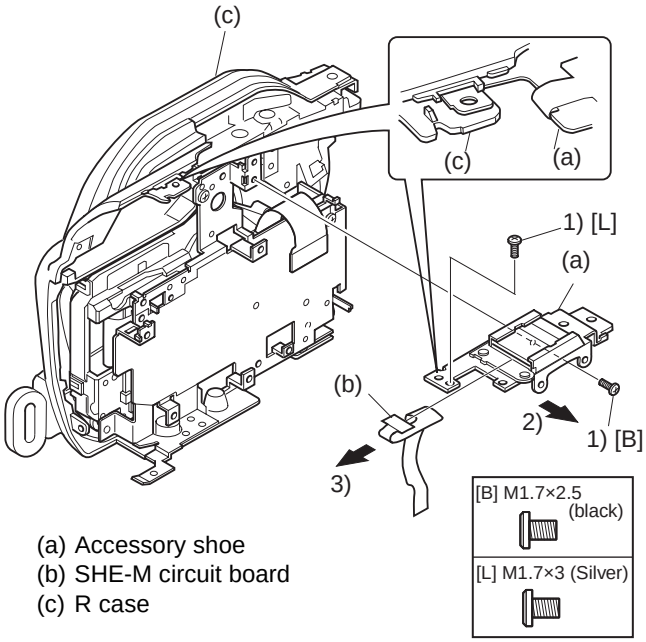


Fig. 5-3-17

(18) Accessory Shoe and SHE-M Circuit Board [DZ-MV780A]

1) Remove the screw [B] and screw [L].
2) Remove the accessory shoe (a) together with the SHE-M circuit board (b) in the direction of the arrow.
3) Remove the screw SHE-M circuit board from accessory shoe in the direction of the arrow.



(a) Accessory shoe
(b) SHE-M circuit board
(c) R case

Fig. 5-3-18

(19) R Cover [DZ-GX20A/MV780A/MV730A]

1) Remove the screw [F].
2) Move the R cover (a) in the direction of the arrow to release the tab.
3) Remove the R cover in the direction of the arrow.

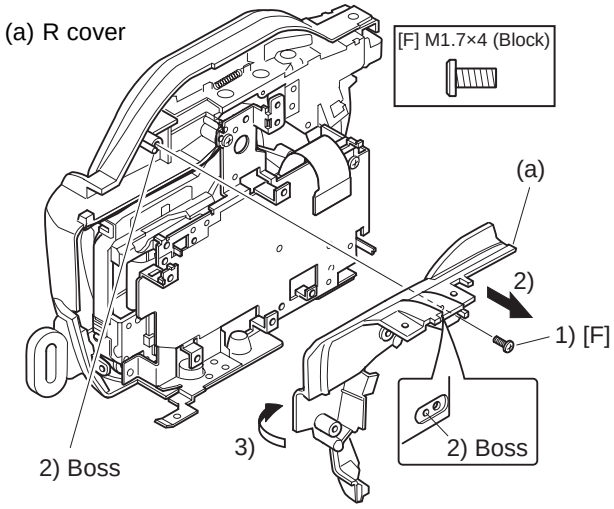


Fig. 5-3-19

(20) R Case, Frame, Disc Drive Unit and DRF-H/DRF-M/DRF-L Circuit Board

[DZ-GX20A/MV780A/MV730A]

1) Disconnect the flat cable.
2) Remove the two screws [A].
3) Remove the two screws [F], and then remove the R case (a).
4) Remove the three screws [G], and then remove the frame (b).
5) Remove the DRF-H/DRF-M/DRF-L circuit board (d) from the circuit board in disc drive unit (c) in the direction of the arrow.

Note:
The disc drive unit is a precision component: Take great care when handling it. Do not subject the disc drive unit to any impact: Doing so could cause a fault.

Caution during disassembly and reassembly:
Be sure to paste the heat sink rubber (e): Neglecting this could cause a fault.

(a) R case
(b) Frame
(c) Disc drive unit
(d) DRF-H/DRF-M/
DRF-L circuit board
(e) Heat sink rubber

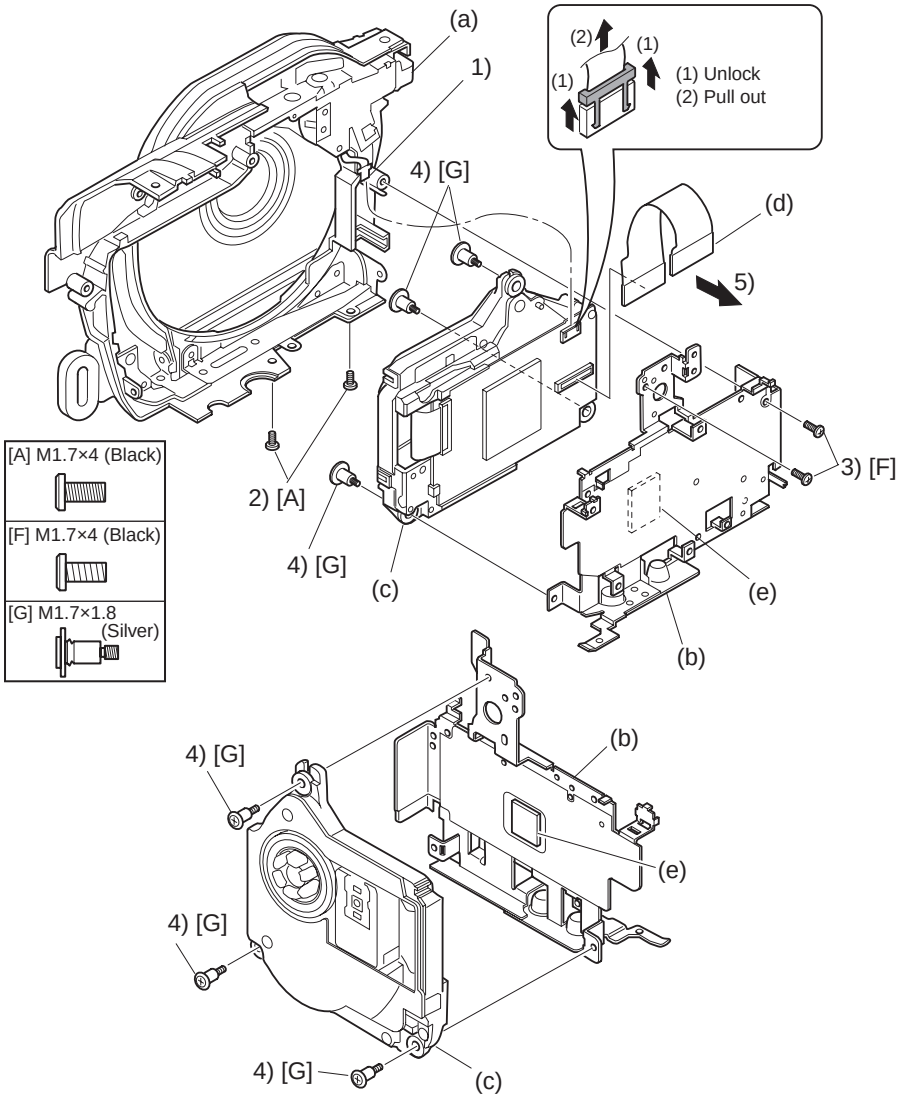


Fig. 5-3-20

(21) Lock Unit [DZ-GX20A/MV780A/MV730A]

1) With the disc insertion block closed, remove the screw [F].
2) Move the lock slider (b) in the direction of the arrow to open the disc insertion block.
3) Remove the four screws [B].

Caution during disassembly and reassembly:
Be sure to close the disc insertion block before tightening the screw on the switch of lock unit (c), and make sure that the switch is attached as shown in the figure: Screwing the switch with the disc insertion block open could damage it.

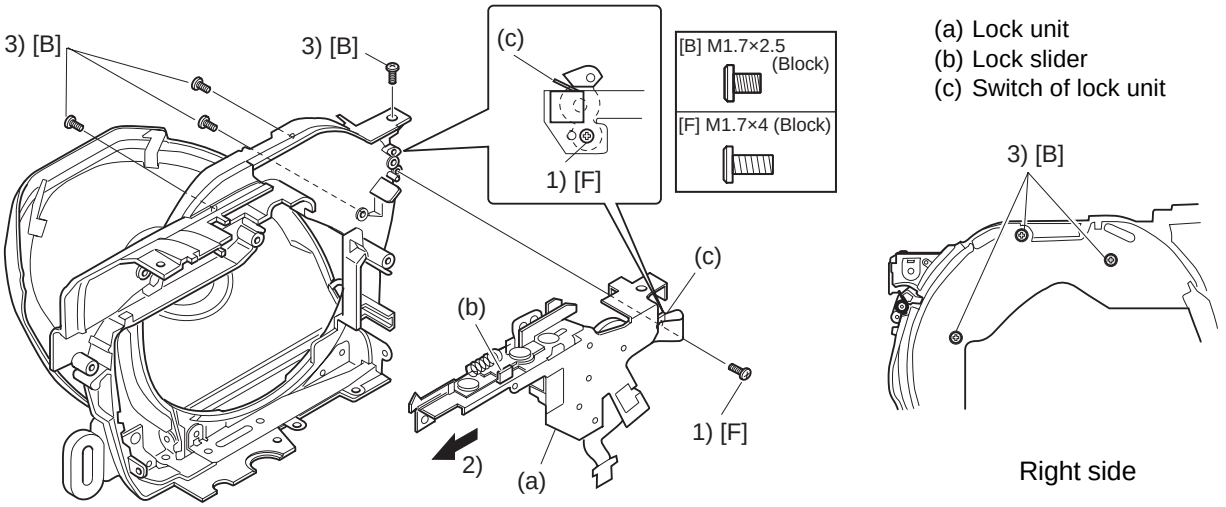


Fig. 5-3-21

(22) Adjustment Cover, L Case and LCD Unit [DZ-GX20A/MV780A/MV730A]

1) Insert a fine-tipped flat-bladed screwdriver (e) into the groove in adjustment cover (a), and remove the cover from L case (b) in the direction of the arrow: Be very careful not to scratch the cover or L case with screwdriver.
2) Remove the two screws [J], taking care not to lose the LCD ground plate (d), which will be detached at this time.

Note:
Take great care when handling the LCD unit. The LCD unit has an LCD panel that is a precision component: Subjecting it to any impact could result in a fault.

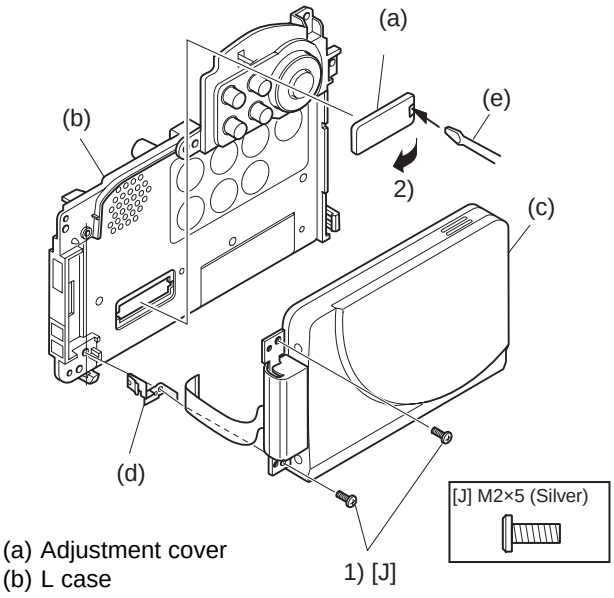


Fig. 5-3-22

(23) LCD Case U and Fulcrum Unit [DZ-GX20A/MV780A/MV730A]

1) Turn the fulcrum unit (b) 90° in the direction of the arrow.
2) Remove the three screws [C].
3) Release the six tabs and remove the LCD case U (a) in the direction of the arrow, taking care not to lose the MR sheet (c), which will be detached at this time.
4) Release the connection between the LCD circuit board (e) and MR circuit board (d).
5) Remove the MR circuit board in the direction of the arrow. The MR circuit board is a film-like board: Do not forcibly fold or bend it.
6) Disconnect the flat cable.
7) Remove the fulcrum unit in the direction of the arrow.

(a) LCD case U
(b) Fulcrum unit
(c) MR sheet
(d) MR circuit board
(e) LCD circuit board

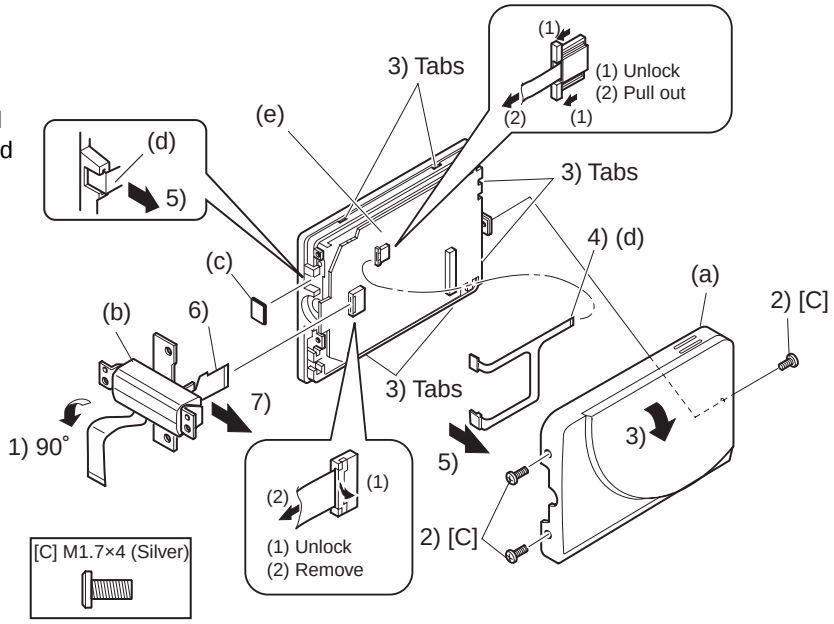
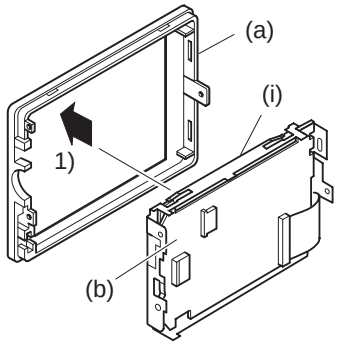


Fig. 5-3-23

(24) LCD Case B [DZ-GX20A/MV780A/MV730A]

1) Remove the LCD case B (a) in the direction of the arrow.



(a) LCD case B
(b) LCD circuit board
(c) Mirror sheet
(d) Light guide plate (d)
(e) Diffusion sheet
(f) Prism sheets
(g) LCD panel
(h) Monitor sheet
(i) LCD frame

Fig. 5-3-24a

Note:

1) Do not remove the LCD circuit board (b), mirror sheet (c), light guide plate (d), diffusion sheet (e), prism sheets (f) or LCD panel (g), monitor sheet (h) from the LCD frame (i). And, take care when handling them: Adherence of any dust, foreign object, fingerprint, etc. to them, or any scratches or impact, could result in a fault.
2) If the LCD circuit board, mirror sheet, light guide plate, diffusion sheet, prism sheets, monitor sheet or LCD panel become detached from the LCD frame, assemble them as shown below:

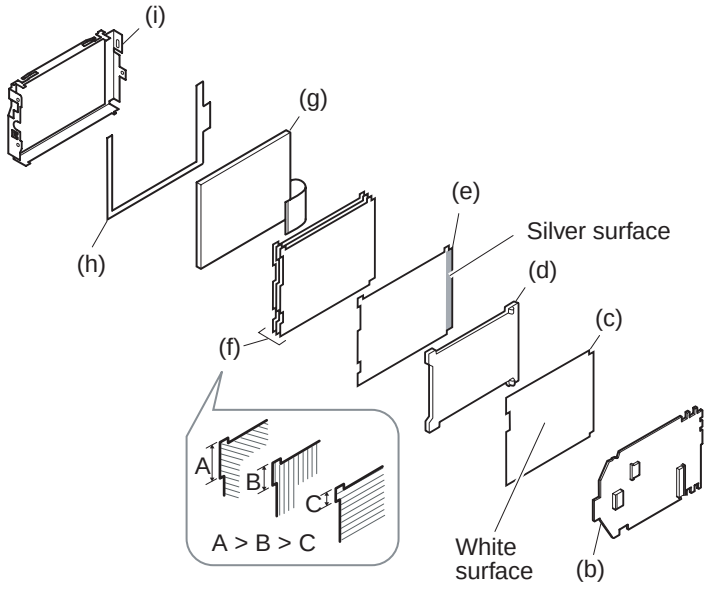
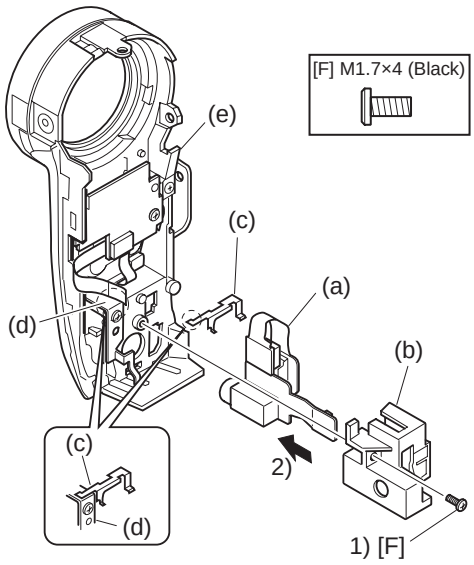


Fig. 5-3-24b

(25) AVJ-H/AVJ-M/AVJ-L Circuit Board [DZ-GX20A/MV780A/MV730A]

1) Remove the screw [F], taking care not to lose the ground plate (c), which will be detached at this time.
2) Remove the AVJ-H/AVJ-M/AVJ-L circuit board (a) from jack holder (b) in the direction of the arrow.

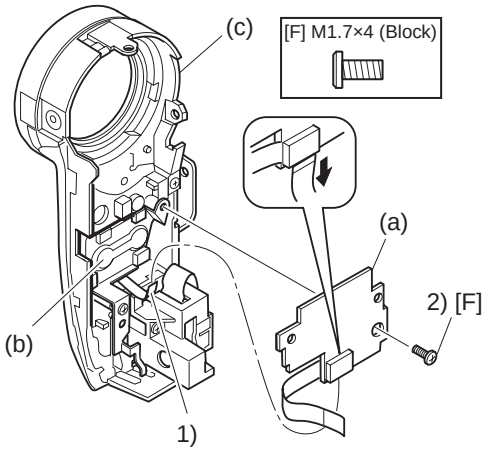


(a) AVJ-H/AVJ-M/AVJ-L circuit board
(b) Jack holder
(c) Ground plate
(d) Microphone
(e) Front case

Fig. 5-3-25

(26) FRT-H/FRT-M/FRT-L Circuit Board [DZ-GX20A/MV780A/MV730A]

1) Release the connection between the microphone and FRT-H/FRT-M/FRT-L circuit board (a).
2) Remove the screw [F].



(a) FRT-H/FRT-M/FRT-L circuit board
(b) Microphone
(c) Front case

Fig. 5-3-26

(27) Microphone and Front Case [DZ-GX20A/MV780A/MV730A]

1) Remove the screw [F] and then remove the microphone (a) from the front case (b).

(a) Microphone
(b) Front case

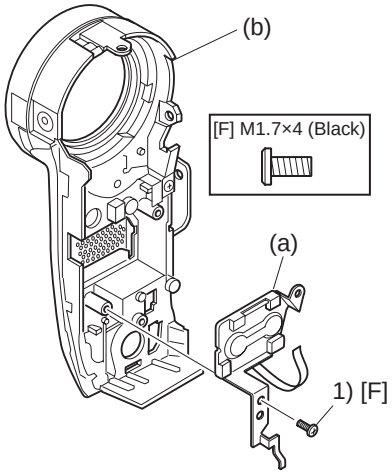


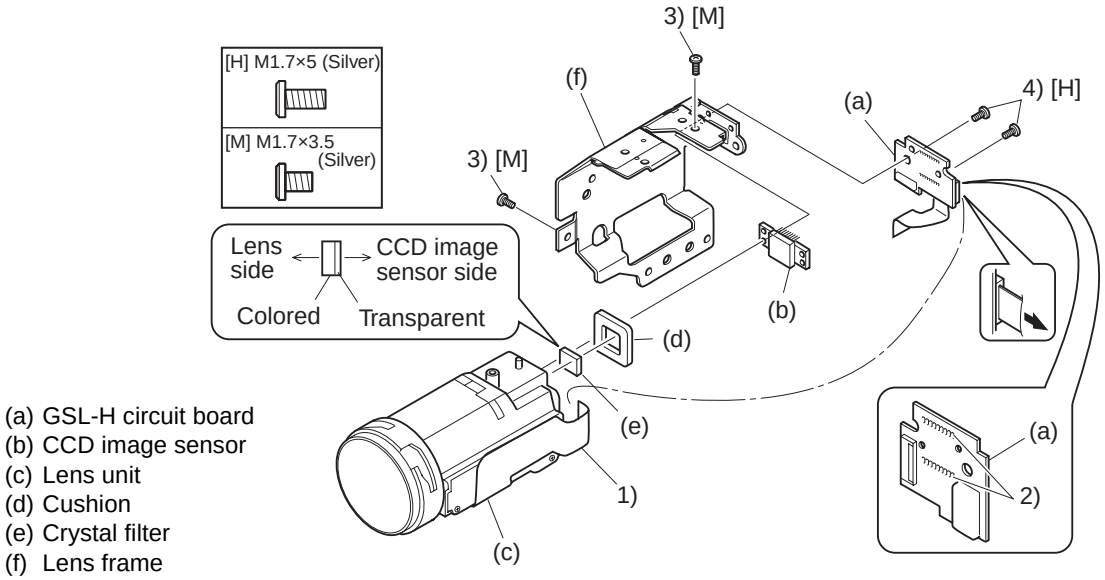
Fig. 5-3-27

(28) GSL-H Circuit Board, CCD Image Sensor, Lens Unit, Cushion, Crystal Filter, Lens Frame [DZ-GX20A]

1) Disconnect the flat cable.
2) Unsolder the 18 points at the CCD image sensor terminal on GSL-H circuit board (a).
3) Remove the two screws [M].
4) Remove the two screws [H], and then remove the lens frame (f), CCD image sensor (b), lens unit (c), cushion (d) and crystal filter (e).

Note:
1) The CCD image sensor, lens unit and crystal filter are precision components: Take great care when handling them. Adherence of any dust, foreign object, fingerprint, etc. to them, or any scratches or impact, could cause a fault.
2) Never use metal tweezers to handle the crystal filter: Doing so could damage it.

Cautions during disassembly and reassembly:
Take care with the orientation of crystal filter when assembling it: Incorrect orientation of the crystal filter could cause a fault.



(a) GSL-H circuit board
(b) CCD image sensor
(c) Lens unit
(d) Cushion
(e) Crystal filter
(f) Lens frame

Fig. 5-3-28

(29) Lens Frame, Lens Unit, Cushion and Crystal Filter [DZ-MV780A]

1) Disconnect the flat cable.
2) Remove the screw [E].
3) Turn the GSL-M circuit board (e) up in the direction of the arrow.
4) Remove the two screws [F] and then remove the lens frame (a).
5) Remove the two screws [J], and then remove the lens unit (b), cushion (c) and crystal filter (d).

Note:
1) The lens unit and crystal filter are precision components: Take great care when handling them. Adherence of any dust, foreign object, fingerprint, etc. to them, or any scratches or impact, could cause a fault.
2) Never use metal tweezers to handle the crystal filter: Doing so could damage it.

Caution during disassembly and reassembly:
Take care with the orientation of crystal filter when assembling it: Incorrect orientation of the crystal filter could cause a fault.

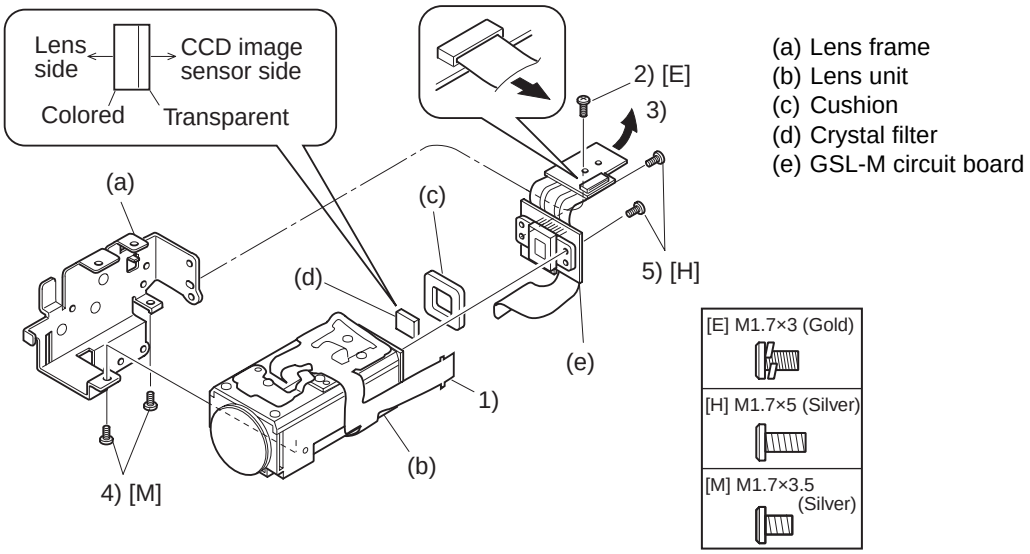


Fig. 5-3-29

(30) CCD Image Sensor and GSL-M Circuit Board [DZ-MV780A]

1) Unsolder the 14 points at the CCD image sensor (a) terminal on GSL-M circuit board (b).

Note:
The CCD image sensor is a precision component: Take great care when handling it. Adherence of any dust, foreign object, fingerprint, etc. to it, or any scratches or impact, could cause a fault.

(a) CCD image sensor
(b) GSL-M circuit board

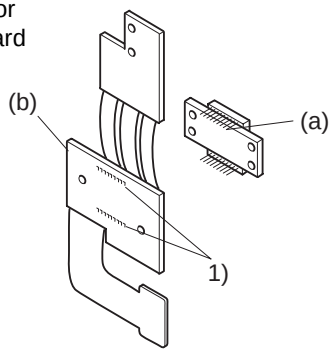


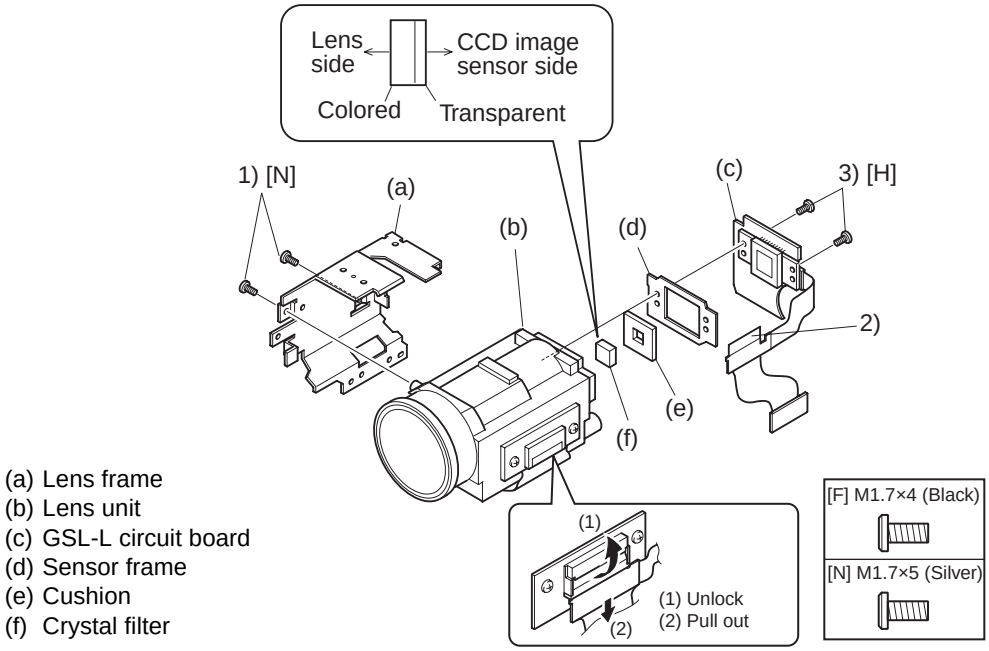
Fig. 5-3-30

(31) Lens Frame and Lens Unit [DZ-MV730A]

1) Remove the two screws [F] and then remove the lens frame (a).
2) Disconnect the flat cable.
3) Remove the two screws [H], and then remove the lens unit (b), sensor frame (d), cushion (e) and crystal filter (f).

Note:
1) The lens unit and crystal filter are precision components: Take great care when handling them. Adherence of any dust, foreign object, fingerprint, etc. to them, or any scratches or impact, could cause a fault.
2) Never use metal tweezers to handle the crystal filter: Doing so could damage it.

Caution during disassembly and reassembly:
Take care with the orientation of crystal filter when assembling it: Incorrect orientation of the crystal filter could cause a fault.



(a) Lens frame
(b) Lens unit
(c) GSL-L circuit board
(d) Sensor frame
(e) Cushion
(f) Crystal filter

Fig. 5-3-31

(32) CCD Image Sensor and GSL-L Circuit Board [DZ-MV730A]

1) Unsolder the 14 points at the CCD image sensor (a) terminal on GSL-L circuit board (b).

Caution:
The CCD image sensor is a precision component: Take great care when handling it. Adherence of any dust, foreign object, fingerprint, etc. to it, or any scratches or impact, could cause a fault.

(a) CCD image sensor
(b) GSL-L circuit board

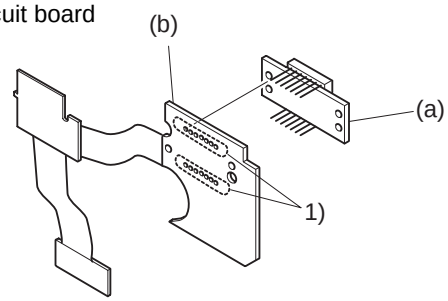


Fig. 5-3-32

6 Adjustment

6-1 Creating Reference Data

The reference data is necessary for adjustment: The adjustment program will not operate normally without it. Before adjustment, be sure to create the reference data, using the same model (with normal camera block) as the one to be adjusted.

Information:

1) The reference data is used to reduce the difference between environments of servicing site and factory (color temperature of light box, etc.). Using the reference data will increase adjustment accuracy.
2) The reference data is usually created once for each model because it is recorded on hard disk drive (HDD) of PC with the adjustment program. However, creating reference data again is necessary in the following cases:
   a) When performing adjustment using a light box that is different from that used when the reference data was created.
   b) When performing maintenance of the light box used when creating the reference data (replacing fluorescent light, etc.).
   c) When performing adjustment using a C12 light balancing filter that is different from that used when the reference data was created.
   d) When deleting the folder containing the adjustment program from HDD.

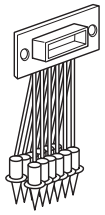
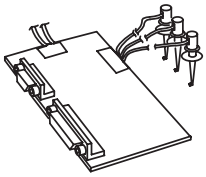
Restrictions:

If the same model with normal camera block as the one to be adjusted is not available, the reference data can be created by the following procedure. However, reference data created this way has been prepared at the factory, assuming the environment of service workplace, and may not be suitable for all service workplaces. Therefore, it is recommended that you create reference data using the same model with normal camera block as that to be adjusted.

1) Store the adjustment program on HDD, referring to "6-1-5 Copying or Deleting Adjustment Program".
2) Start up Explorer and open the refdata folder in map05w folder.
3) Refer to the following table to check the reference data file name of the model to be adjusted.
4) Copy the file with the same name as the reference data file name checked in step 3) in refdata folder to map05w folder.

Model	Name of reference data file
DZ-GX20A	gx20a.dat
DZ-MV780A	m780a.dat
DZ-MV730A	m730a.dat

6-1-1 List of Jigs and Tools used when Creating Reference Data

<table>
<tr><td colspan="2">NEW
Adjustment floppy disk
Note: Create the data using the adjustment data downloaded from Internet. If downloading is not possible, call 1-800-HITACHI to find out where to send the product for repair.</td><td colspan="2">NEW
Halcyon connector
Parts No. TP14391
  </td></tr>
<tr><td colspan="4">Personal computer (PC)
Computer on which any of the following OS operates and which has a floppy disk drive and RS-232C terminal (*1)
OS: Windows 95/98/98 Second Edition/Me/2000 Professional/XP/NT4.0
 </td></tr>
<tr><td colspan="2">C12 light balancing filter
(Diameter: 46mm)
(Generally available)
 </td><td colspan="2">DSP-R jig
Parts No. 7099448
  </td></tr>
<tr><td colspan="2">RS-232C cable (9-pin or 25-pin straight type)
[Generally available]
Check the number of pins of RS-232C terminals on PC and DSP-R jig and the shapes (male/female) before purchasing.</td><td>AV/S input/output or output cable
[Accessory: Parts No. EW12525]</td><td>DZ-ACS2
AC adapter/charger
[Accessory](*2)</td></tr>
<tr><td>Power cable for AC adapter/charger
[Accessory](*2)</td><td>DC power cord
[Accessory: Parts No. EV11011]</td><td colspan="2"></td></tr>
</table>

*1: The adjustment program used on DVD video camera/recorder is exclusively for Windows 95/98/98 Second Edition/Me/2000 Professional/XP/NT4.0: The program cannot be run on MS-DOS.

*2: The part numbers of AC adapter/charger and power cable are different depending on the destination: Refer to the “Replacement Parts List” for the part numbers.

CH 1

6-1-2 Power Supply and Materials for Creating Reference Data

1) DVD video camera/recorder that is the same model as the one to be adjusted and whose camera block is operating normally.

> Note:
> It is recommended that you use a brand-new unit of the same model when creating the reference data. If such a unit is not available, use the same model of the DVD video camera/recorder that is received from customer for repairing fault in disc drive that is other than in the camera block, and one where there is no problem in recording of camera image and the zoom is operating normally.

2) 3100 K light box (maintenance is necessary)
3) Color monitor (color TV with AV input jacks)
4) DC power supply for DSP-R jig (5 V/1 A)

6-1-3 Connections when Creating Reference Data

Connect the DVD video camera/recorder (for creating reference data), jigs and test equipment as shown in Fig. 6-1-1.

> **Caution**
> It is very dangerous to perform any work with the DVD video camera/recorder disassembled, since the DVD video camera/recorder has a laser-emitting block and high-voltage circuits: Do not remove any parts other than the adjustment cover.

(1) Setting of light box

1) Use a light box whose color temperature is controlled with no flickering: Using an inappropriate light box will interference with work.

(2) Setting and disassembly of DVD video camera/recorder

1) Open the LCD monitor and insert a fine-tipped flat-bladed screwdriver into the groove in adjustment cover, and remove the cover from L case in the direction of the arrow: Be very careful not to scratch the cover or L case with screwdriver.
2) Set the light box 30-50 cm away from DVD video camera/recorder, and eliminate any effects from surrounding light, except where such designation is given.
3) Set the lens surface of DVD video camera/recorder in parallel with the surface of light box as far as possible, and adjust the focus.
4) Use a small tripod to fix the DVD video camera/recorder, making certain it does not move during creation of reference data.

Note:
Always connect the Halcyon connector before connecting the DC power cord to the DVD video camera/recorder : Connecting the Halcyon connector after powering the DVD video camera/recorder could cause a fault.

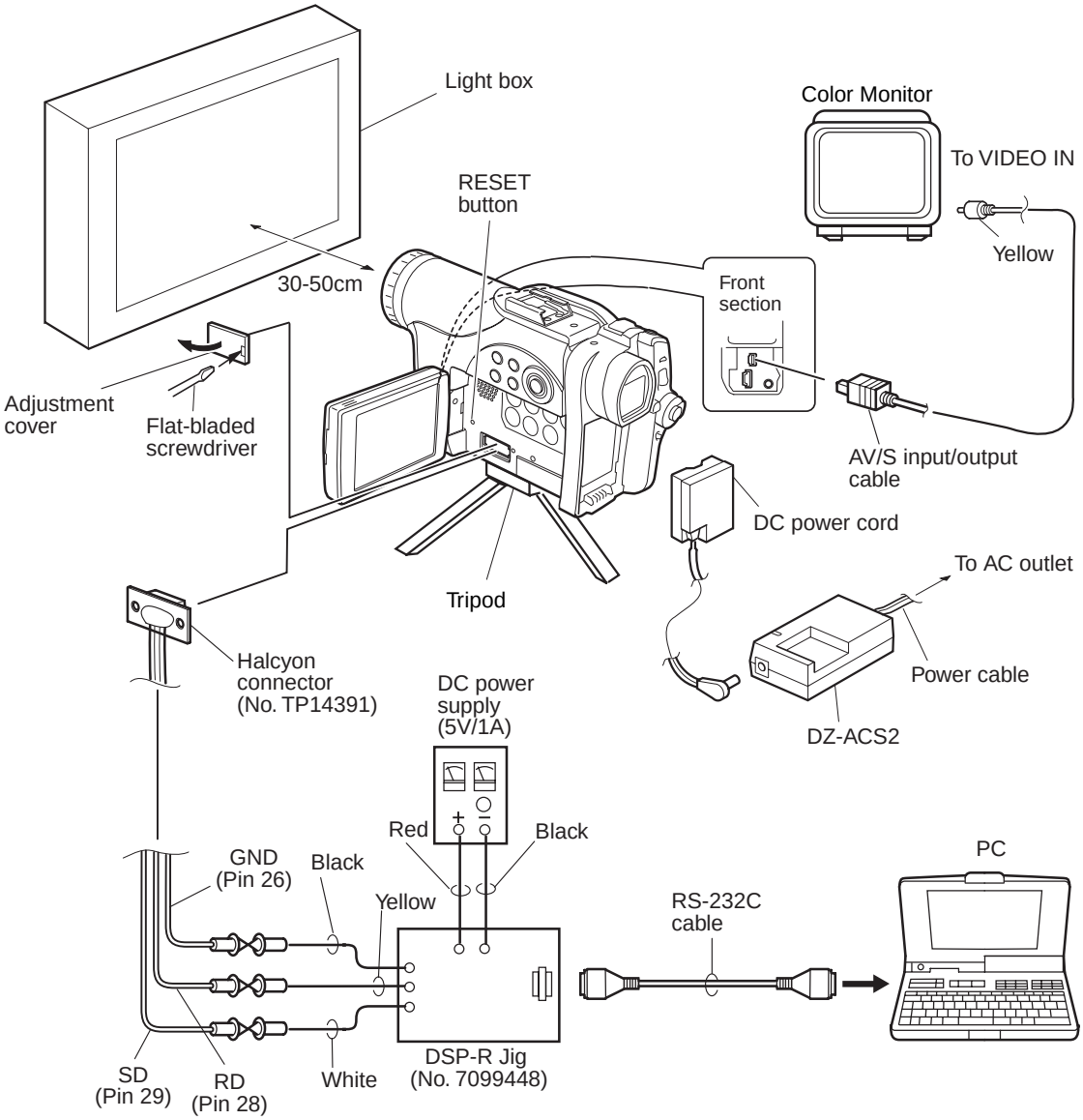


Fig. 6-1-1 Connections when Creating Reference Data

6-1-4 Settings when Creating Reference Data

When the connections for creating reference data are complete, set the DVD video camera/recorder and test equipment as follows:

1) Make sure that no disc or card is inserted: Neither is necessary when creating reference data.
2) Set the power switch to "VIDEO": After that operate the DVD video camera/recorder while watching the LCD monitor screen.
3) Press the MENU button to display the camera function setup screen.
4) Use the ⏮ / ⏭ / ◀◀ / ▶▶ buttons to choose "Initial Setup", and then press the ▶/II button.
5) Use the ⏮ / ⏭ / ◀◀ / ▶▶ buttons to choose "Reset", and then press the ▶/II button.
6) Use the ⏮ / ⏭ / ◀◀ / ▶▶ buttons to choose "YES", and then press the ▶/II button.
7) When reset is complete, use the above procedure to operate the ⏮ / ⏭ / ◀◀ / ▶▶ buttons and set Demo Mode in the Initial Setup menu to "Off": Forgetting to set it to "Off" will cause a problem during creation of reference data.
8) Press the MENU button to restore the normal display.

Information:

The following table shows the menu status after the above settings:

The settings for Date Setup are not shown in the table below, since they do not have any meaning when creating reference data.

Item	Setting
Camera Functions Setup	
Program AE	Auto
White Bal.	Auto
EIS	On
Dig. Zoom	×40
MIC Filter	Off
Flash(*1)	Auto
Recording Functions Setup	
VIDEO Mode	FINE
Quality	FINE
16:9	Off
Input Source	CAMERA
PHOTO Input	Field
Self Timer	Off
OSD Output	Off

Item	Setting
LCD/EVF Setup	
LCD Brightness	
EVF Brightness	
Color Level	
EVF Display	Auto
Initial Setup	
Beep	On
Power Save	Off
Record LED	On
Language	English
Demo Mode	Off

*1: DZ-GX20A only

6-1-5 Copying or Deleting Adjustment Program

Information:
The program for creating reference data is included in the adjustment program.

(1) Copy

1) Start the PC.
2) Start Explorer and create a new folder in HDD of PC. The name “map05w” is recommended for the folder: If a folder with the same name exists, give the folder a similar name that is easily understandable.

Note:
Be sure to manage the adjustment programs for Windows and MS-DOS in different folders: Managing them in the same folder will interfere with adjustment.

3) Copy all the folders and files on adjustment floppy disk to the map05w folder.

(2) Deleting

If it is necessary to delete the adjustment program from hard disk drive (HDD) of PC, delete the map05w folder that was created during storage.

6-1-6 Starting and Terminating Reference Data Creation Program

Make sure that the connections are correct, the power switch on DVD video camera/recorder is set to “VIDEO”, and the DC power supply for DSP-R jig is turned on: The reference data creation program will not start unless the connections for creating reference data are correct, and the DVD video camera/recorder or DSP-R jig is powered.
For subsequent operation, operate the PC mouse while watching the PC monitor screen.

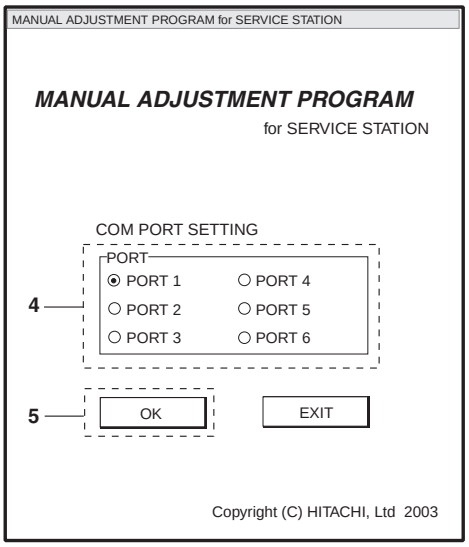
Information:
1) Display ×××× on subsequent PC screen shows the model name.
2) The numbers on PC screens show the operational procedure.

(1) Start

1) Start the PC. If the PC has already started, terminate all other applications.
2) Start Explorer, and double-click the “SETUPforMAP2005W.EXE” file in map05w folder to start the program.
3) Once the program has started, the COMMUNICATION PORT SETTING screen will appear.

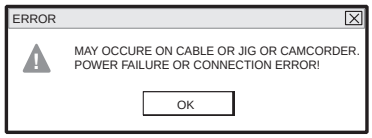
4) Choose the communication port to which the RS-232C cable is connected, and then choose the radio button of corresponding port on COMMUNICATION PORT SETTING screen.
5) Click the OK button on the COMMUNICATION PORT SETTING screen, and then proceed with the MODEL SELECT screen.

COMMUNICATION PORT SETTING screen



Note:
If the following dialogs appear, perform the troubleshooting below:

POWER OR CONNECTION ERROR dialog



COM PORT ERROR dialog

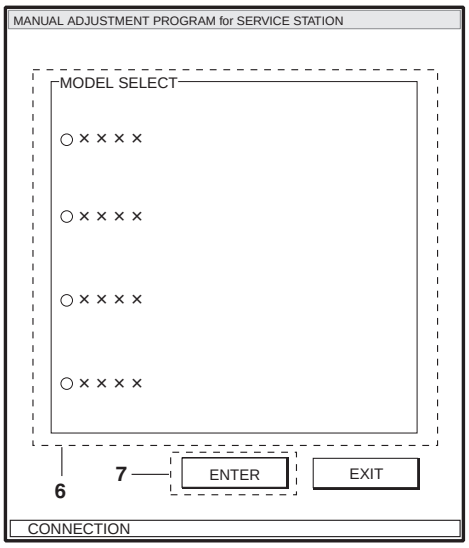
When the power or connection error dialog appears:
A connection is incorrect or power is not turned on.
Make sure that all connections are correct and that power is supplied to the reference data creating device or DSP-R interface jig.
Clicking the OK button will finish the program:
After solving the problem, restart the program.

When the communication port error dialog appears:
There was a mistake in selecting communication port.
Check the communication port.
Clicking the OK button will finish the program:
Select the communication port again after restart.

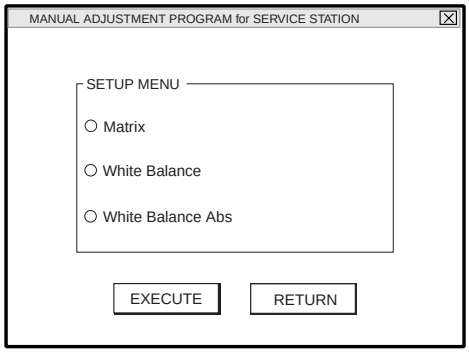
6) Choose the radio button of corresponding model name in MODEL SELECT screen.
7) Click the ENTER button in MODEL SELECT screen, and then proceed with the SETUP MENU screen. Refer to next item for subsequent operations. If there is an error in model selection, the FILE HANDLE ERROR dialog will appear. Click the OK button, and then choose the correct model.

Note:
If the FILE HANDLE ERROR dialog appears when the correct model has been chosen, obtain (download) the newest adjustment program, and then start over again. If the FILE HANDLE ERROR dialog still appears with the newest adjustment program, check with the factory.

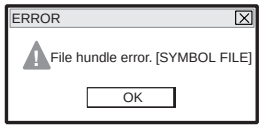
MODEL SELECT screen.



SETUP MENU screen.



FILE HANDLE ERROR dialog



(2) Termination

1) Click the RETURN button on MENU screen of program to return to the MODEL SELECT screen.
2) Click the EXIT button on the MODEL SELECT screen.

Information:
If the PC does not accept any operation during work, or the reference data creating program does not work, perform the following procedure:
1) Set the power switch of reference data creating device to “OFF”.
2) Turn off the DC power supply of DSP-R jig.
3) Simultaneously press the Ctrl, Alt and Delete keys on PC keyboard to restart the PC.
4) After the PC restarts, set the power switch of reference data creating device to “VIDEO” and turn on the DC power supply of DSP-R jig again.
5) Restart the reference data creating program.

6-1-7 Creating Reference Data

Start the setup program.

For subsequent operation, operate the PC mouse while watching the PC monitor screen.

Information:

It takes approx. 20 minutes to create reference data.

The following shows the times required for each item:

Matrix: Approx. 10 minutes

White Balance: Approx. 10 minutes

White Balance Abs: Approx. 30 seconds

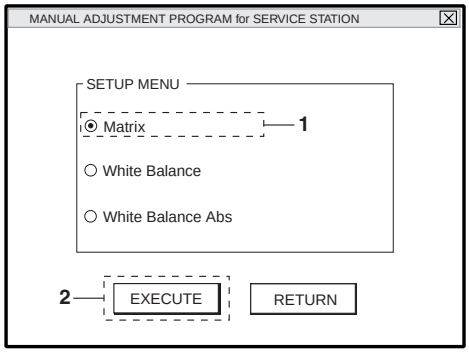
Preparation:

1) Point at light box without chart, filling the screen.
2) Prepare the C12 light balancing filter (step-up rings): Attach it during setup.

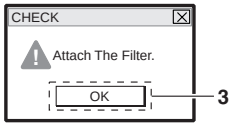
Procedure:

1) Choose MATRIX on the SETUP MENU screen.
2) Click the EXECUTE button on SETUP MENU screen to start setup.
3) The ATTACH THE FILTER dialog will appear during setup. Attach the C12 light balancing filter over the lens of DVD video camera/recorder, and then click the OK button in ATTACH THE FILTER dialog.
4) The REMOVE THE FILTER dialog will appear during setup.
   Remove the C12 light balancing filter from the lens of DVD video camera/recorder, and then click the OK button in REMOVE THE FILTER dialog.
   After that, the ATTACH THE FILTER dialog and REMOVE THE FILTER dialog may occasionally appear: Reattach the C12 light balancing filter and remove it each time.
5) When setup is complete, the SETUP FINISHED dialog will appear: Click the OK button in
   dialog to restore the SETUP MENU screen.
   When setup is complete with the C12 light balancing filter attached, remove the C12 light balancing filter.
6) Choose WHITE BALANCE on the SETUP MENU screen.
7) Repeat steps 2)-5).

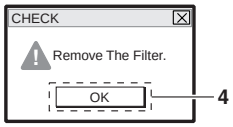
SETUP MENU screen.



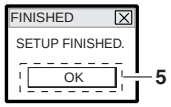
ATTACH THE FILTER dialog



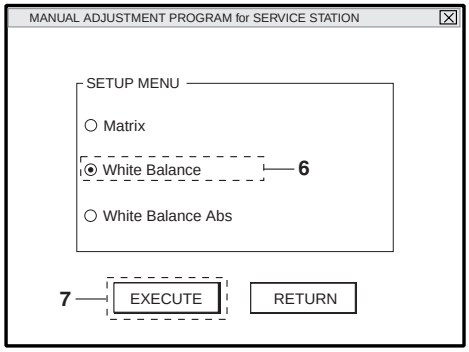
REMOVE THE FILTER dialog



SETUP FINISHED dialog



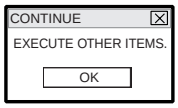
SETUP MENU screen.



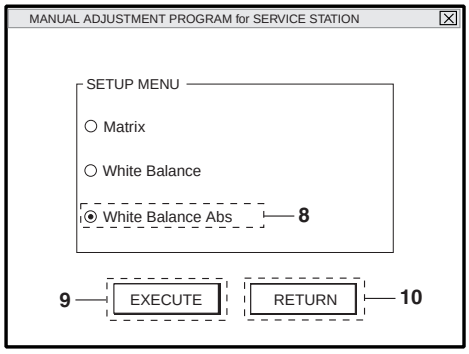
8) Choose WHITE BALANCE ABS on the SETUP MENU screen.
9) Repeat steps 2)-5).
10) Click the RETURN button on SETUP MENU screen.
11) The ALL SETUP FINISH dialog will appear: Click the OK button to complete the creation of reference data.

Note:
Neither Matrix, White Balance nor White Balance Abs in SETUP MENU can be executed independently. Be sure to execute all items at the same time.
If you click the RETURN button on the SETUP MENU screen with an unfinished item, the EXECUTE OTHER ITEMS dialog will appear. Click the OK button in EXECUTE OTHER ITEMS dialog, and then execute the unfinished items.

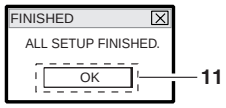
EXECUTE OTHER ITEMS dialog



SETUP MENU screen.



ALL SETUP FINISH dialog



6-2 Setups for Adjustment

6-2-1 Checking Reference Data

Before starting adjustment, check whether it will be necessary to create the reference data or not, referring to the flowchart below:

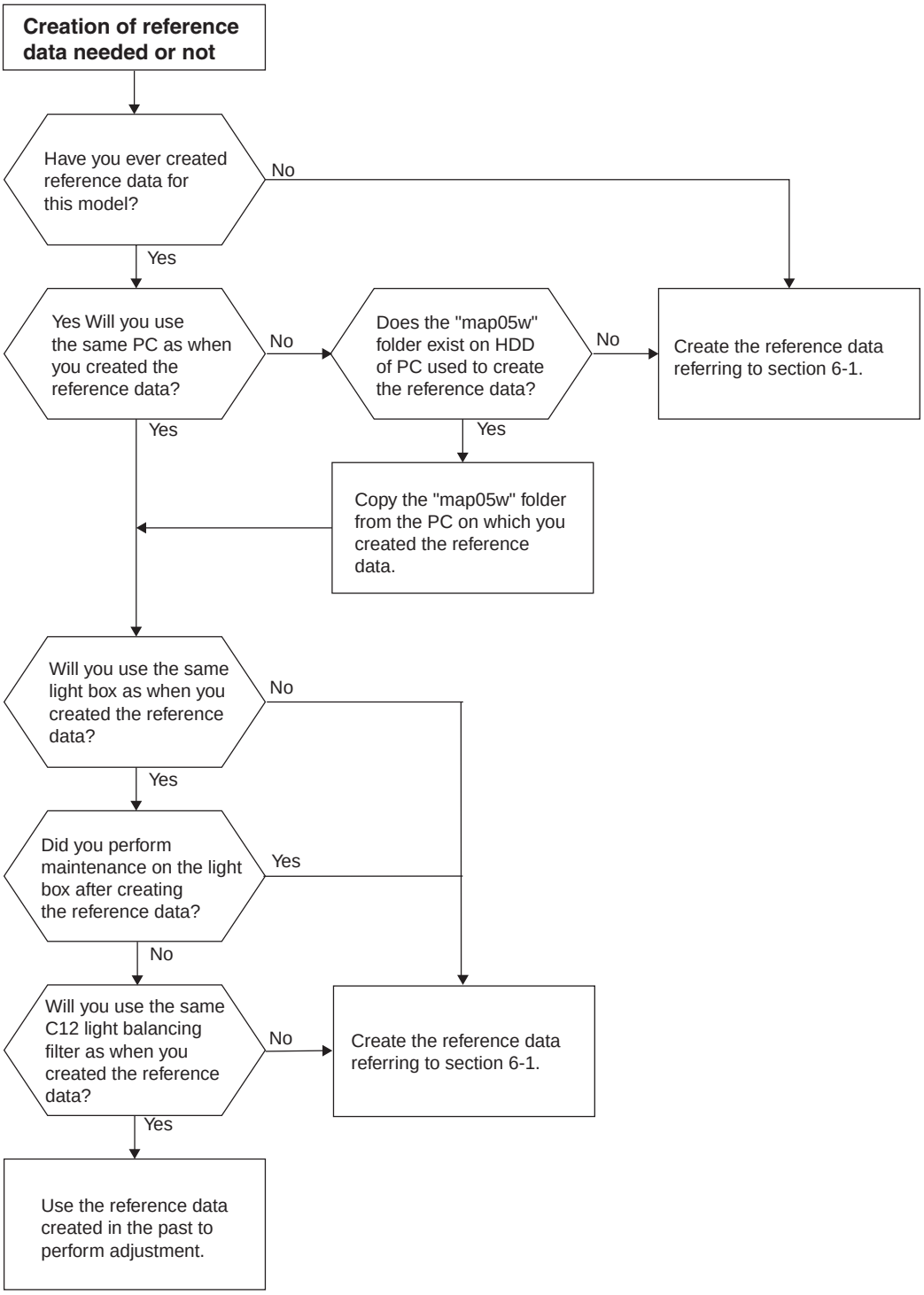

Creation of reference data needed or not
Have you ever created reference data for this model?
No
Yes
Yes Will you use the same PC as when you created the reference data?
No
Does the "map05w" folder exist on HDD of PC used to create the reference data?
No
Create the reference data referring to section 6-1.
Yes
Yes
Copy the "map05w" folder from the PC on which you created the reference data.
Will you use the same light box as when you created the reference data?
No
Yes
Did you perform maintenance on the light box after creating the reference data?
Yes
No
Will you use the same C12 light balancing filter as when you created the reference data?
No
Create the reference data referring to section 6-1.
Yes
Use the reference data created in the past to perform adjustment.

Fig. 6-2-1 Reference Data Check Flowchart

6-2-2 List of Jigs and Tools for Adjustment

Same as when creating reference data: Refer to "6-1-1 List of jigs and tools when creating reference data" for details.

1) Personal computer
2) Adjustment floppy disc
3) Halcyon connector
4) C12 light balance filter
5) DSP-R Jig
6) RS-232C cable
7) AV/S input/output cable
8) DZ-ACS2
9) Power cable
10) DC power cord

6-2-3 Test Equipment, Power Supply and Charts for Adjustment

1) Color bar chart
2) 3100 K light box (maintenance is necessary)
3) Backfocus chart
4) Color monitor (color TV with AV input jacks)
5) Oscilloscope
6) Vectorscope
7) Digital voltmeter
8) Frequency counter
9) DC power supply for DSP-R jig (5 V/1 A)

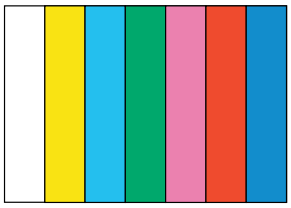


Fig. 6-2-2 Color Bar Chart

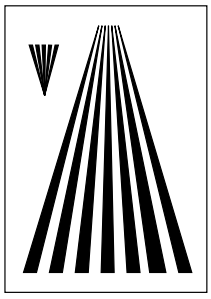


Fig. 6-2-3 Backfocus Chart

Information:
It is recommended that you use a vectorscope when performing the chroma gain adjustment.
You can use an oscilloscope instead: Note, however, that the adjustment accuracy will be lower.

6-2-4 Connections for Adjustment

Connect the DVD video camera/recorder, jigs and test equipment as shown in the Fig. 6-2-4.

Caution
It is very dangerous to perform any work with the DVD video camera/recorder disassembled, since the DVD video camera/recorder has a laser-emitting block and high-voltage circuits: Do not remove any parts other than the adjustment cover.

(1) Setting of light box

1) Use the same light box as when the reference data was created: Its color temperature and illuminance are strictly controlled and free from flickering. If the setting of color box is not appropriate, the adjustment program may not operate normally.

(2) Setting and disassembly of DVD video camera/recorder

1) Open the LCD monitor and insert a fine-tipped flat-bladed screwdriver into the groove in adjustment cover, and remove the cover from L case in the direction of the arrow: Be very careful not to scratch the cover or L case with screwdriver.
2) Set the light box 30-50 cm away from DVD video camera/recorder, and eliminate any effects from surrounding light, except where such designation is given.
3) Set the lens surface of DVD video camera/recorder in parallel with the surface of light box as far as possible, and adjust the focus.
4) Use a small tripod to fix the DVD video camera/recorder, making certain it does not move during creation of reference data.
5) Be sure to connect the video output of DVD video camera/recorder to the video input jack of color monitor, which is usually terminated by 75 ohm: If the video output is not terminated by 75 ohm, the video output value cannot be measured correctly.

Note:
Always connect the Halcyon connector before connecting the DC power cord to the DVD video camera/recorder: Connecting the Halcyon connector after powering the DVD video camera/recorder could cause a fault.

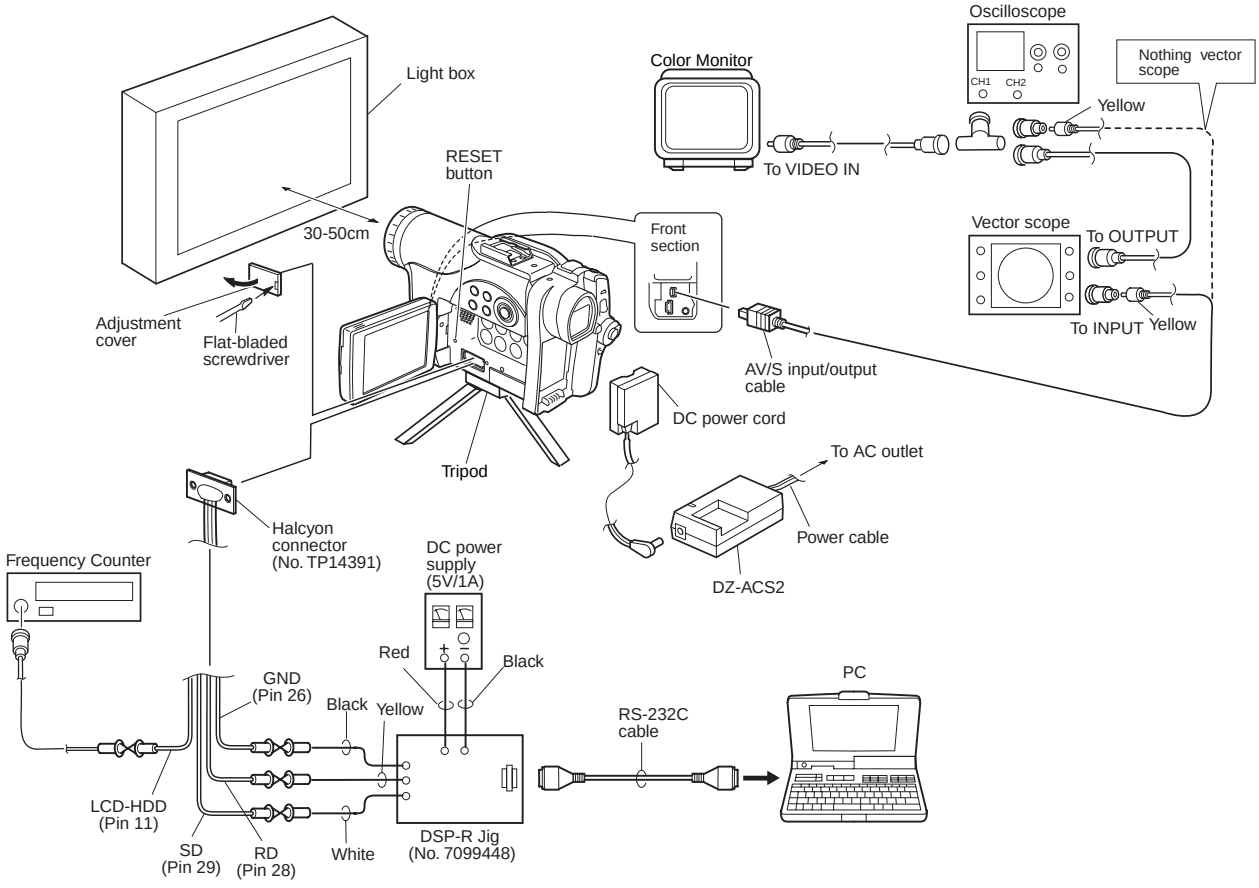


Fig. 6-2-4 Connections for Adjustment

6-2-5 Settings for Adjustment

When the connections for adjustment are complete, set the DVD video camera/recorder and test equipment as follows:

(1) Setting the DVD video camera/recorder

Information:
This item is the same as when creating reference data.

1) Make sure that no disc or card is inserted: Neither is necessary when creating reference data.
2) Set the power switch to "VIDEO": After that operate the DVD video camera/recorder while watching the LCD monitor screen.
3) Press the MENU button to display the camera function setup screen.
4) Use the ⏮ / ⏭ / ◀◀ / ▶▶ buttons to choose "Initial Setup", and then press the ▶/II button.
5) Use the ⏮ / ⏭ / ◀◀ / ▶▶ buttons to choose "Reset", and then press the ▶/II button.
6) Use the ⏮ / ⏭ / ◀◀ / ▶▶ buttons to choose "YES", and then press the ▶/II button.
7) When reset is complete, use the above procedure to operate the ⏮ / ⏭ / ◀◀ / ▶▶ buttons and set Demo Mode in the Initial Setup menu to "Off": Forgetting to set it to "Off" will cause a problem during creation of reference data.
8) Press the MENU button to restore the normal display.

Information:
The following table shows the menu status after the above settings:
The settings for Date Setup are not shown in the table below, since they do not have any meaning when creating reference data.

Item	Setting
Camera Functions Setup	
Program AE	Auto
White Bal.	Auto
EIS	On
Dig. Zoom	×40
MIC Filter	Off
Flash(*1)	Auto
Recording Functions Setup	
VIDEO Mode	FINE
Quality	FINE
16:9	Off
Input Source	CAMERA
PHOTO Input	Field
Self Timer	Off
OSD Output	Off

Item	Setting
LCD/EVF Setup	
LCD Brightness	
EVF Brightness	
Color Level	
EVF Display	Auto
Initial Setup	
Beep	On
Power Save	Off
Record LED	On
Language	English
Demo Mode	Off

*1: DZ-GX20A only

(2) Setting test equipment

The names of switches, etc. of test equipment may vary depending on the manufacturer and model. Some switches in addition to those shown below may have to be set: See the instruction manual of test equipment for details.

1) Oscilloscope

a) Probe:	10:1
b) TIME/DIV:	10 or 20 μs (except where some other designation is given)
c) VOLTS/DIV:	Change depending on the measurement object
d) TRIGGER SOURCE:	CH1 (except where some other designation is given)
e) AC/DC/GND:	AC

2) Vectorscope

a) SATURATION:	75%

6-2-6 Starting and Terminating Adjustment Program

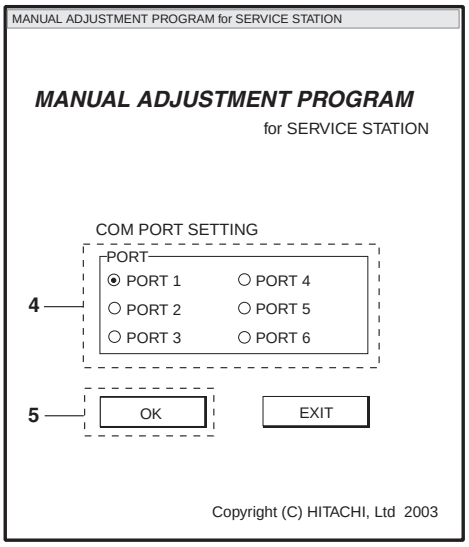
Make sure that the connections are correct, the power switch on DVD video camera/recorder is set to "VIDEO", and the DC power supply for DSP-R jig is turned on. The adjustment program will not start unless the connections for adjustment are correct, and the DVD video camera/recorder or DSP-R jig is powered.

Information:
1) Display ×××× on subsequent PC screen shows the model name.
2) The numbers on PC screens show the operational procedure.

(1) Start

1) Start the PC. If the PC has already started, terminate all other applications.
2) Start Explorer, and double-click the "MAP2005W.EXE" file in map05w folder to start the adjustment program.
3) Once the adjustment program has started, the COMMUNICATION PORT SETTING screen will appear.
4) Check the communication port to which the RS-232C cable is connected, and then choose the radio button of corresponding port on COMMUNICATION PORT SETTING screen.
5) Click the OK button on the COMMUNICATION PORT SETTING screen, and then proceed with the MODEL SELECT screen.

COMMUNICATION PORT SETTING screen

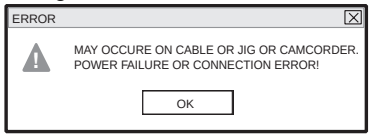


Note:
If the dialogs on right appear, perform the following troubleshooting:

When the power or connection error dialog appears:
A connection is incorrect or power is not turned on.
Make sure that all connections are correct and that power is supplied to the reference data creating device or DSP-R interface jig.
Clicking the OK button will finish the program:
After solving the problem, restart the program.

When the communication port error dialog appears:
There was a mistake in selecting communication port.
Check the communication port.
Clicking the OK button will finish the program:
Select the communication port again after restart.

POWER OR CONNECTION ERROR dialog



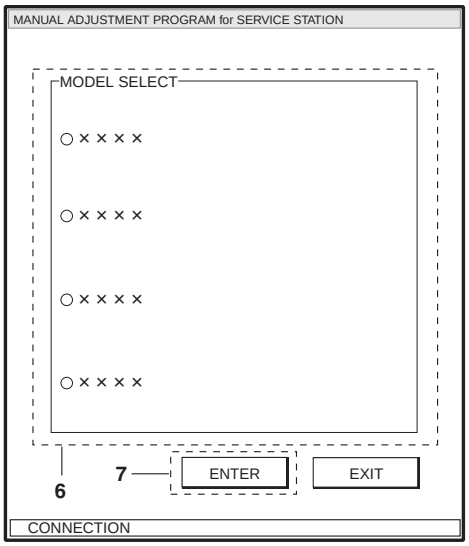
COM PORT ERROR dialog

Information:
When communications between the PC and DVD video camera/recorder are normal during adjustment, the word "CONNECTION" in status bar (bottom left) of each screen will flash.

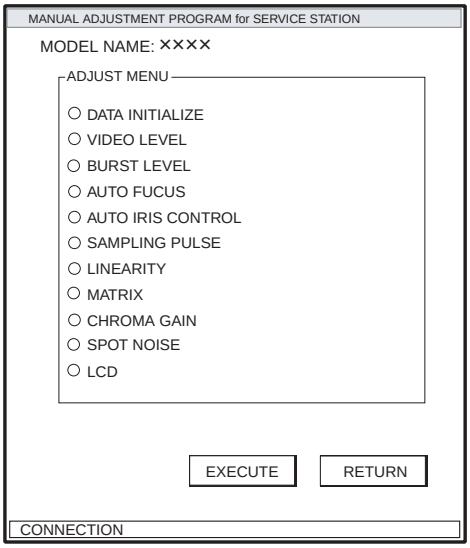
6) Choose the radio button of corresponding model name in MODEL SELECT screen.
7) Click the ENTER button in MODEL SELECT screen, and then proceed with the ADJUST MENU screen.
Start of the adjustment program is now complete. Refer to "6-4 Adjustment Procedure" for subsequent operations.
If there is an error in model selection, the FILE HANDLE ERROR dialog will appear. Click the OK button, and then choose the correct model.

Note:
If the FILE HANDLE ERROR dialog appears when the correct model has been chosen, obtain (download) the newest adjustment program, and then start over again.
If the FILE HANDLE ERROR dialog still appears with the newest adjustment program, check with the factory.

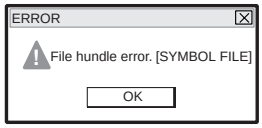
MODEL SELECT screen.



ADJUST MENU screen.



FILE HANDLE ERROR dialog



(2) Termination

1) Click the RETURN button on MENU screen of adjustment program to return to the MODEL SELECT screen.
2) Click the EXIT button on the MODEL SELECT screen.

Information:
If the PC does not accept any operation during work, or the reference data creating program does not work, perform the following procedure:
1) Set the power switch of reference data creating device to “OFF”.
2) Turn off the DC power supply of DSP-R jig.
3) Simultaneously press the Ctrl, Alt and Delete keys on PC keyboard to restart the PC.
4) After the PC restarts, set the power switch of reference data creating device to “VIDEO” and turn on the DC power supply of DSP-R jig again.
5) Restart the reference data creating program.

6-3 List of Adjustment Items

6-3-1 Adjustment Program Hierarchy Diagram

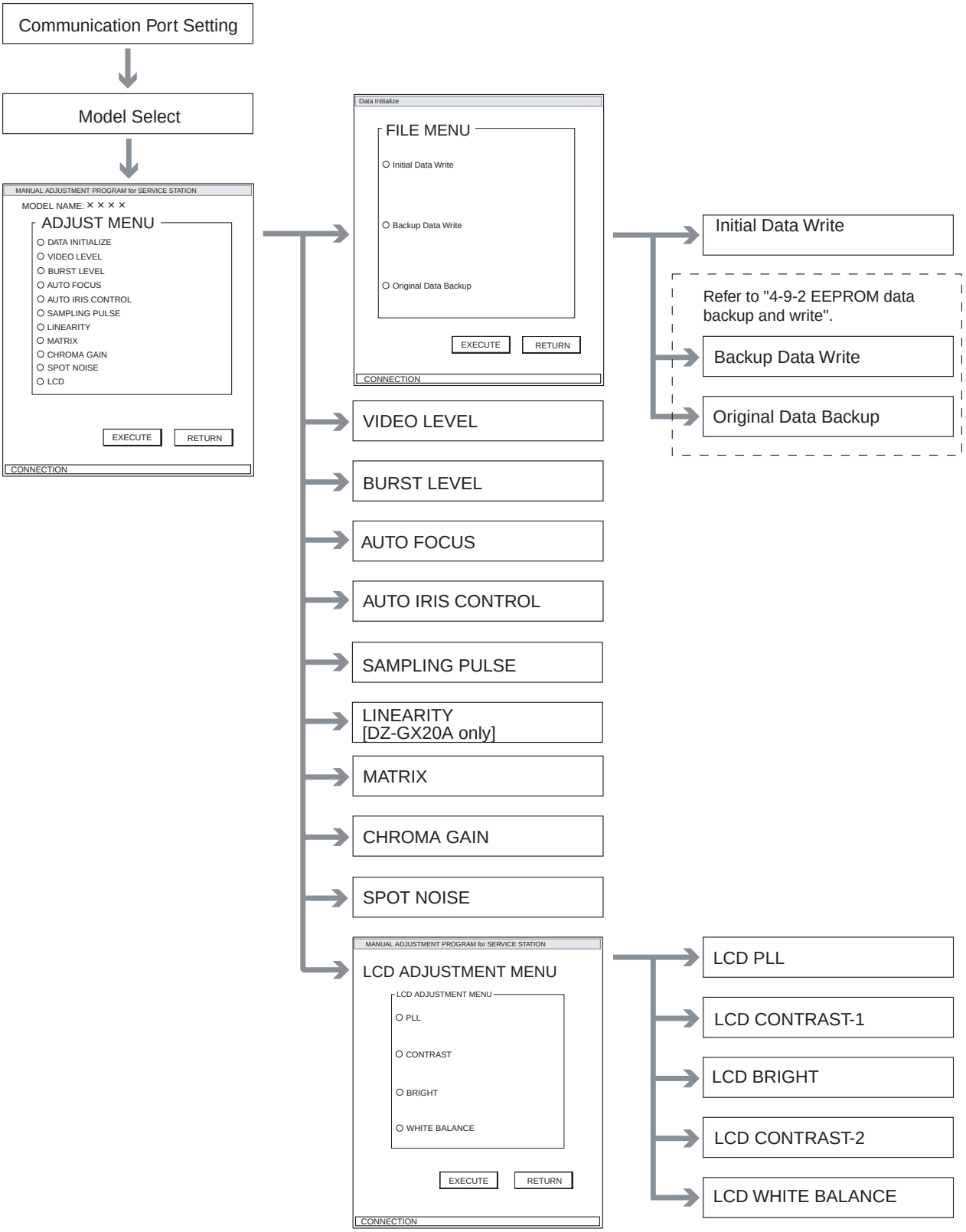


Fig. 6-3-1

6-3-2 List of Adjustments Needed After Replacing Major Components

Item	Major Components			
	MAN circuit board or IC2005 (*1) (EEPROM backup data already written)	MAN circuit board or IC2005 (*1) (EEPROM data backup disabled)(*2)	AEL circuit board	LCD unit
Initial Data Write		●		
Video Level	●	●	●	
Burst Level	●	●	●	
Autofocus		●		
Auto Iris Control	●	●		
Sampling Pulse	●	●		
Linearity(*3)	●	●		
Matrix		●		
Chroma Gain		●		
Spot Noise		●		
LCD PLL	●	●		●
LCD Contrast-1(*4)	●	●		●
LCD Bright(*4)	●	●		●
LCD Contrast-2(*4)	●	●		●
LCD White Balance	●	●		●

*1: Be sure to perform "4-9-2 EEPROM data backup and write" before replacing the MAN circuit board.

*2: "EEPROM data backup disabled" refers to when the backup of EEPROM data from the MAN circuit board to be replaced could not be properly executed due to some fault, such as the DVD video camera/ recorder not being turned on, etc.

*3: DZ-GX20A only.

*4: The following three items cannot be performed singly. Be sure to perform these adjustments as a set with the three items, and in the order stated:

LCD contrast – 1
LCD bright
LCD contrast – 2

Item	Major Components				
	Lens Unit	IC1001 (CCD image sensor)	IC1301	IC2002 IC2003	IC6301
Initial Data Write					
Video Level				●	●
Burst Level				●	●
Autofocus	●	●	●		
Auto Iris Control	●	●	●		
Sampling Pulse					
Linearity(*3)		●			
Matrix		●		●	●
Chroma Gain		●		●	●
Spot Noise		●			
LCD PLL					
LCD Contrast-1(*4)					
LCD Bright(*4)					
LCD Contrast-2(*4)					
LCD White Balance					

*3: DZ-GX20A only.

*4: The following three items cannot be performed singly. Be sure to perform these adjustments as a set with the three items, and in the order stated:

LCD contrast – 1
LCD bright
LCD contrast – 2

6-3-3 Purpose of Adjustments and Incompleted Phenomenon

Item	Purpose	Incompleted Phenomenon
Initial Data Write	To write initial data to EEPROM in which adjustment data has been stored	----------
Video Level	To set the video output level.	The picture becomes dark or whitish.
Burst Level	To set the burst level.	
Autofocus	To set out-of-focus correction level during zoom.	Focus is lost during zooming. It takes time until a subject is brought into focus, or correct focus is not obtained.
Auto Iris Control	To set iris control data.	The picture becomes too bright or dark.
Sampling Pulse	To measure the delay time in sampling IC, and optimize pulse timing.	Diagonal beats and horizontal noise occur.
Linearity	Adjustment item exclusively for DZ-GX20A: Procedure is to match the levels of two-system CCD image sensor outputs.	The brightness (luminance levels) differ on the left and right of screen bounded at the center.
Matrix	To compensate for unevenness in the chroma signal and input auto white balance control data.	Color reproduction becomes defective.
Chroma Gain	To set color saturation for the reference color temperature.	Color of the picture is denser or lighter than that of the subject.
Spot Noise	To correct spot noise.	Spot noise occurs.
LCD PLL	To synchronize LCD image.	Synchronization of LCD image is distorted.
LCD Contrast-1	To set the bright level and contrast of the LCD monitor.	Color reproduction becomes defective of the LCD monitor.
LCD Bright		
LCD Contrast-2		
LCD White Balance		

6-4 Adjustment Procedure

Start the adjustment program referring to "6-2-6 Starting and Terminating Adjustment Program". For the subsequent operation, operate the PC mouse while watching the PC monitor screen.

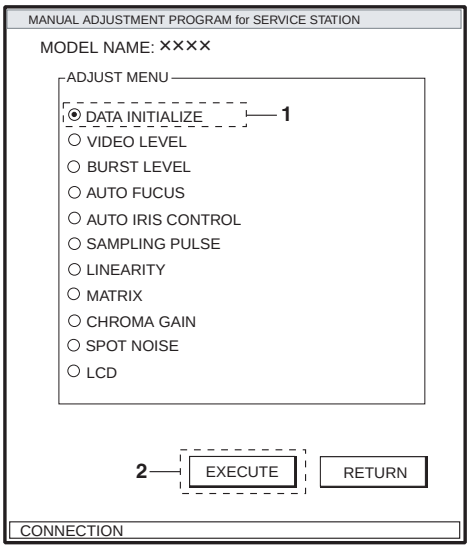
Information:
1) Display ×××× on subsequent PC screen shows the model name.
2) The numbers on PC screens show the operational procedure.

6-4-1 Initial Data Write

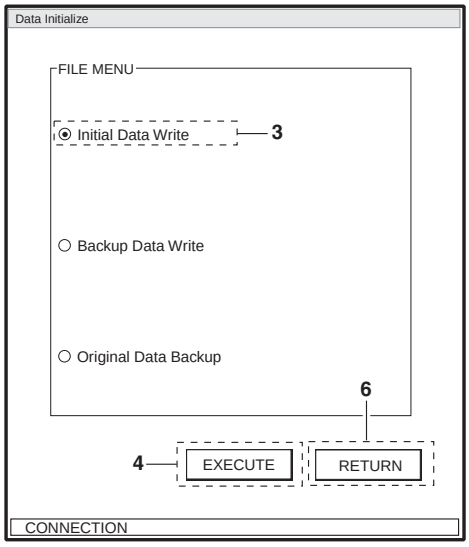
Note:
1) Write the initial data only after the MAN circuit board has been replaced when the backup of EEPROM data could not be performed using the MAN circuit board before replacement.
   Refer to "4-9-2 EEPROM data backup and write" for backup of EEPROM data.
2) Writing the initial data will initialize all the adjustment data in EEPROM. After writing, be sure to perform all the appropriate adjustments.

Procedure:
1) Choose DATA INITIALIZE on the ADJUST MENU screen.
2) Click the EXECUTE button on ADJUST MENU screen to proceed with the DATA INITIALIZE MENU screen.
3) Choose Initial Data Write on the DATA INITIALIZE MENU screen.
4) Click the EXECUTE button on DATA INITIALIZE MENU screen to start writing of initial data.
   The progress status can be confirmed using the PROGRESS STATUS dialog.
5) When writing is complete, the INITIALIZATION FINISHED dialog will appear: Click the OK button in dialog to restore the DATA INITIALIZE MENU screen.
6) Click the RETURN button on DATA INITIALIZE MENU screen to restore the ADJUST MENU screen, and then be sure to perform all the adjustment items.

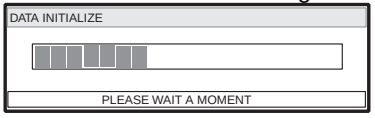
ADJUST MENU screen



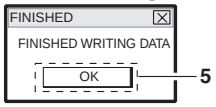
DATA INITIALIZE MENU screen



PROGRESS STATUS dialog



INITIALIZATION FINISHED dialog



6-4-2 Video Level

Preparations:

1) Connect the oscilloscope CH1 to video out.
2) Switch the oscilloscope V-MODE to “CH1” and TRIGGER SOURCE to “CH1”.

Procedure:

1) Choose VIDEO LEVEL on the ADJUST MENU screen.
2) Click the EXECUTE button on ADJUST MENU screen to proceed with the VIDEO LEVEL ADJUSTMENT screen.
3) Click the UP or DOWN button so that level of waveform is 1.0 ± 0.05 Vp-p. Click the button at approx. 2-second intervals while checking any increase or decrease in level of waveform.
4) After step 3) is complete, be sure to click the SAVE button.
   Note that clicking the RETURN button will restore the ADJUST MENU screen to the status before the adjustment was performed.
5) When save is complete, the ADJUSTMENT FINISHED dialog will appear: Click the OK button in dialog to restore the ADJUST MENU screen.

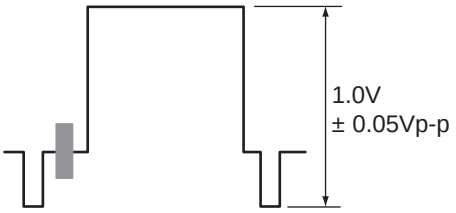
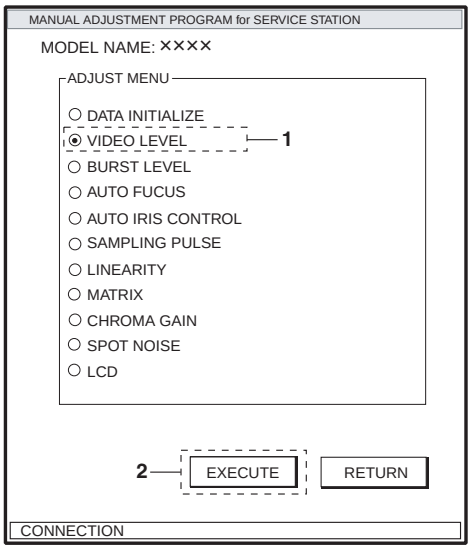
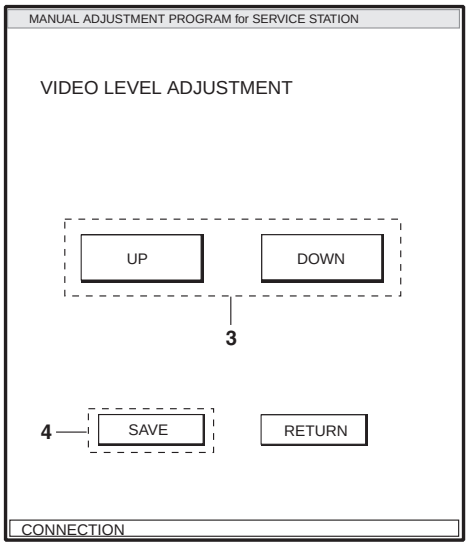


Fig. 6-4-1

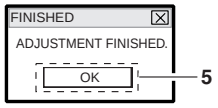
ADJUST MENU screen



VIDEO LEVEL ADJUSTMENT screen



ADJUSTMENT FINISHED dialog



6-4-3 Burst Level

Preparations:

1) Connect the oscilloscope CH1 to video out.
2) Switch the oscilloscope V-MODE to “CH1” and TRIGGER SOURCE to “CH1”.

Procedure:

1) Choose BURST LEVEL on the ADJUST MENU screen.
2) Click the EXECUTE button on ADJUST MENU screen to proceed with the BURST LEVEL ADJUSTMENT screen.
3) Click the UP or DOWN button so that burst level of the waveform is 286mV ± 15 mVp-p. Click the button at approx. 2-second intervals while checking any increase or decrease in burst level.
4) After step 3) is complete, be sure to click the SAVE button.
   Note that clicking the RETURN button will restore the ADJUST MENU screen to the status before the adjustment was performed.
5) When save is complete, the ADJUSTMENT FINISHED dialog will appear: Click the OK button in dialog to restore the ADJUST MENU screen.

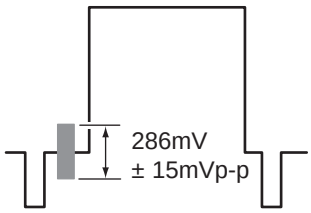
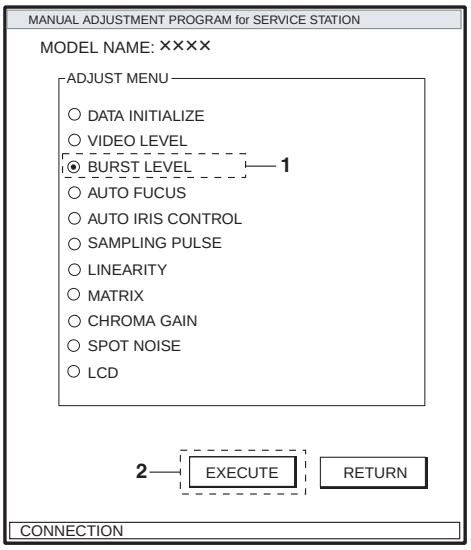
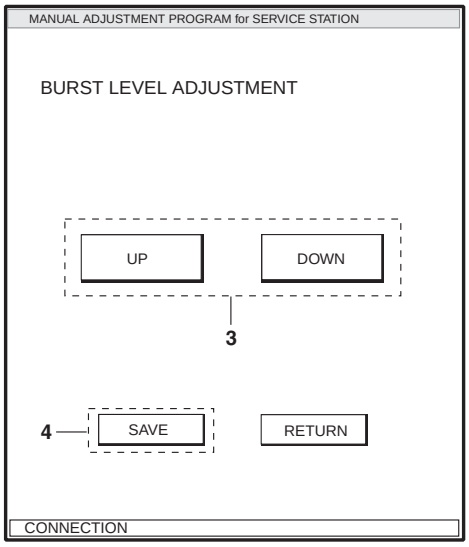


Fig. 6-4-2

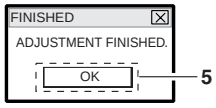
ADJUST MENU screen



BURST LEVEL ADJUSTMENT screen



ADJUSTMENT FINISHED dialog



6-4-4 Autofocus

Preparations:

1) Use the backfocus chart vertically (portrait mode) as shown in Fig. 6-4-3.
2) Point at backfocus chart 1500mm ± 5 mm away from the lens surface: Measure the distance precisely.
3) Set the zoom to telephoto end, and make sure that the center of backfocus chart appears.
4) If an illuminometer is available and the brightness of illumination can be varied, set the illuminance of backfocus chart surface to 200-400 lx. This setting is not necessary if the brightness of illumination cannot be varied: Perform adjustment under indoor light that is as bright as possible.

Procedure:

1) Choose AUTO FOCUS on the adjustment menu screen.
2) Click the EXECUTE button on ADJUST MENU screen to start adjustment.
3) When adjustment is complete, the ADJUSTMENT FINISHED dialog will appear: Click the OK button in dialog to restore the ADJUST MENU screen.
   If the AF ADJUSTMENT ERROR dialog appears, click the OK button in dialog, perform the following troubleshooting, and then execute readjustment:
   a) Increase the illumination.
   b) Set the distance between the backfocus chart and lens surface precisely to 1500mm ± 5 mm.

   If the AF adjustment error dialog still appears even after troubleshooting, the connection of lens unit may be incorrect or the unit may be faulty.

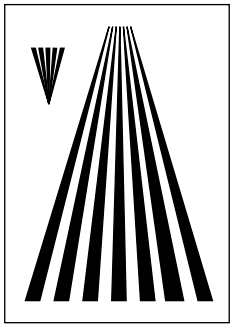
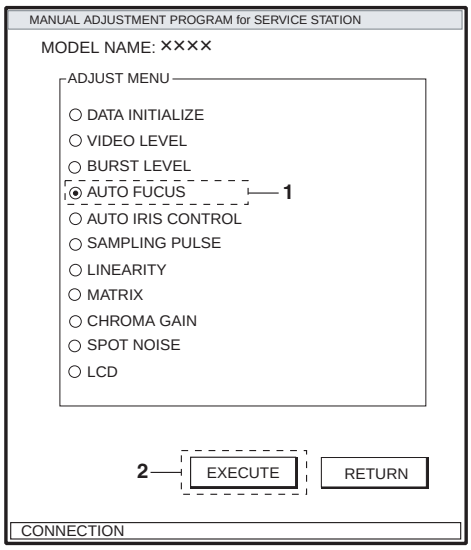
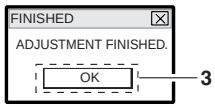


Fig. 6-4-3 Backfocus Chart

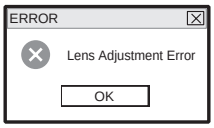
ADJUST MENU screen



ADJUSTMENT FINISHED dialog



AF ADJUSTMENT ERROR dialog



6-4-5 Auto Iris Control

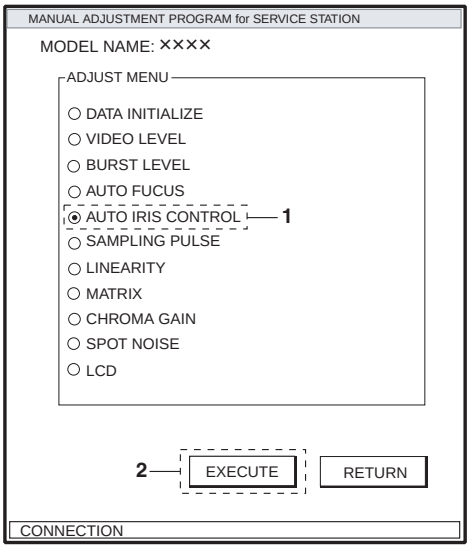
Preparation:

Set zoom to wide-angle end, and point at light box without chart, filling the screen.

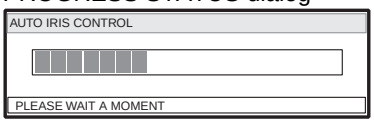
Procedure:

1) Choose AUTO IRIS CONTROL on the ADJUST MENU screen.
2) Click the EXECUTE button on ADJUST MENU screen to start adjustment.
   The progress status can be confirmed using the PROGRESS STATUS dialog.
3) When adjustment is complete, the ADJUSTMENT FINISHED dialog will appear: Click the OK button in dialog to restore the ADJUST MENU screen.
   If the IRIS ADJUSTMENT ERROR dialog appears, click the OK button in dialog, perform the appropriate corrective action, and then perform readjustment. If the IRIS ADJUSTMENT ERROR dialog still appears after the corrective action, the lens unit may be faulty:
   a) Turn the light box off, and then make sure that no surrounding light reflects on glass surface of light box. If any surrounding light does reflect on it, perform adjustment in a place where no surrounding light will affect the adjustment.
   b) Widen or shorten the distance between the light box and DVD video camera/recorder.

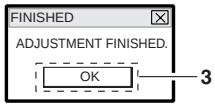
ADJUST MENU screen



PROGRESS STATUS dialog



ADJUSTMENT FINISHED dialog



IRIS ADJUSTMENT ERROR dialog

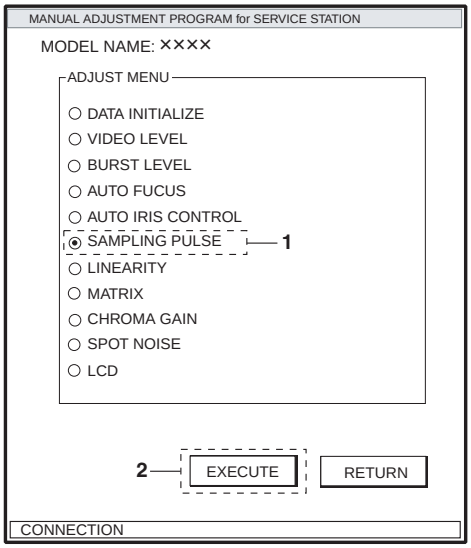
6-4-6 Sampling Pulse

Note:
Start this adjustment after the circuit operation is stabilized, e.g., after leaving the DVD video camera/recorder for at least one hour at normal temperature, and then starting within 90 seconds after turning it on. Unstable circuit operation will cause improper adjustment.

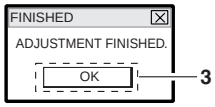
Preparation:
Cap the lens of DVD video camera/recorder.

Procedure:
1) Choose SAMPLING PULSE on the ADJUST MENU screen.
2) Click the EXECUTE button on ADJUST MENU screen to start adjustment.
3) When adjustment is complete, the ADJUSTMENT FINISHED dialog will appear: Click the OK button in dialog to restore the ADJUST MENU screen.

ADJUST MENU screen



ADJUSTMENT FINISHED dialog



6-4-7 Linearity [DZ-GX20A only]

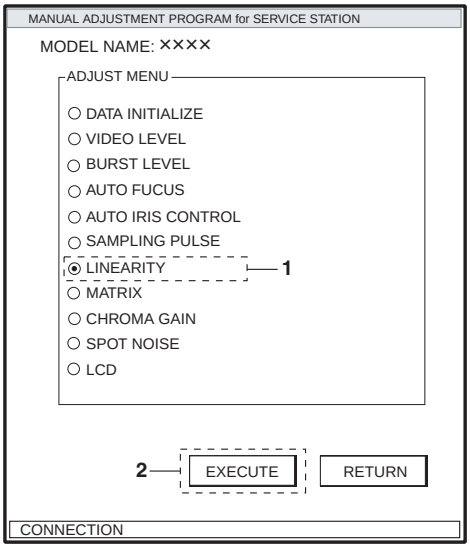
Preparation:

Set zoom to wide-angle end, and point at light box without chart, filling the screen.

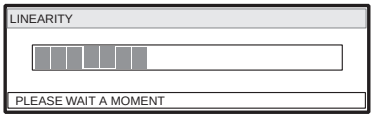
Procedure:

1) Choose LINEARITY on the ADJUST MENU screen.
2) Click the EXECUTE button on ADJUST MENU screen to start adjustment.
   The progress status can be confirmed using the PROGRESS STATUS dialog.
3) When adjustment is complete, the ADJUSTMENT FINISHED dialog will appear: Click the OK button in dialog to restore the ADJUST MENU screen.
   If the LINEARITY ADJUSTMENT ERROR dialog appears, click the OK button in dialog, perform the appropriate corrective action, and then perform readjustment. If the LINEARITY ADJUSTMENT ERROR dialog still appears after the corrective action, the lens unit may be faulty:
   a) Turn the light box off, and then make sure that no surrounding light reflects on glass surface of light box. If any surrounding light does reflect on it, perform adjustment in a place where no surrounding light will affect the adjustment.
   b) Widen or shorten the distance between the light box and DVD video camera/recorder.

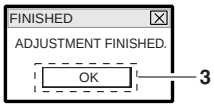
ADJUST MENU screen



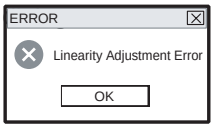
PROGRESS STATUS dialog



ADJUSTMENT FINISHED dialog



LINEARITY ADJUSTMENT ERROR



6-4-8 Matrix

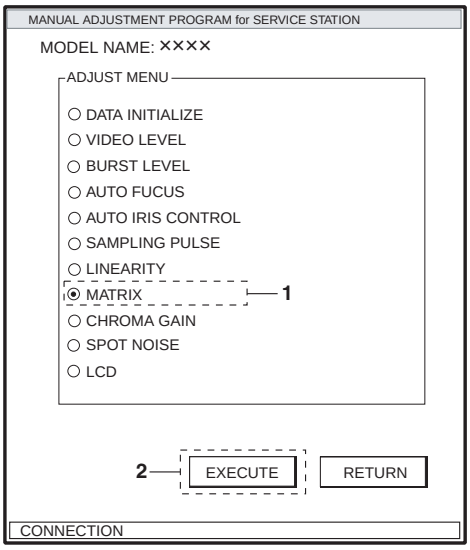
Preparation:

1) Point at light box without chart, filling the screen.
2) Prepare the C12 light balancing filter (step-up rings): Attach it during adjustment.

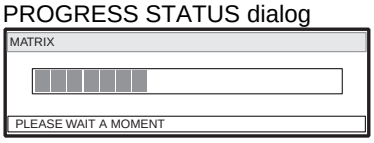
Procedure:

1) Choose MATRIX on the ADJUST MENU screen.
2) Click the EXECUTE button on ADJUST MENU screen to start adjustment.
   The progress status can be confirmed using the PROGRESS STATUS dialog.
3) The ATTACH THE FILTER dialog will appear during setup.
   Attach the C12 light balancing filter over the lens of DVD video camera/recorder, and then click the OK button in ATTACH THE FILTER dialog.
4) The REMOVE THE FILTER dialog will appear during setup.
   Remove the C12 light balancing filter from the lens of DVD video camera/recorder, and then click the OK button in REMOVE THE FILTER dialog.
   After that, the ATTACH THE FILTER dialog and REMOVE THE FILTER dialog may occasionally appear: Reattach the C12 light balancing filter and remove it each time.
5) When adjustment is complete, the ADJUSTMENT FINISHED dialog will appear: Click the OK button in dialog to restore the ADJUST MENU screen.

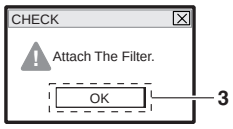
ADJUST MENU screen



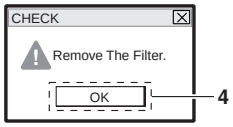
PROGRESS STATUS dialog



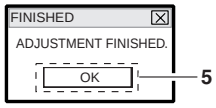
ATTACH THE FILTER dialog



REMOVE THE FILTER dialog



ADJUSTMENT FINISHED dialog



6-4-9 Chroma Gain

Preparation:

1) Point at light box without chart, filling the screen.
2) Prepare the color bar chart: Use it during adjustment.

Procedure:

1) Press the MENU button on DVD video camera/recorder, and ⏮ / ⏭ / ◀◀ / ▶▶ buttons to specify "White Bal.: Set" to display the white balance screen. (See Fig. 6-4-4)
2) Press the ▶/II button: The "▞" mark on the white balance setting screen will blink. Hold down the button until the "▞" mark changes to a steady light.
3) Press the STOP/CANCEL button on DVD video camera/recorder.
4) Insert the color bar chart into light box and point the DVD video camera/recorder at the chart so that it fills the screen.

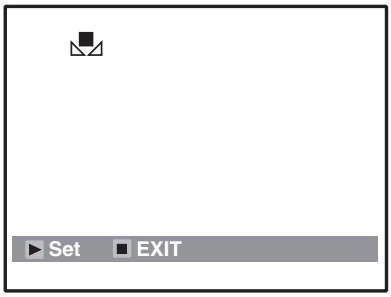
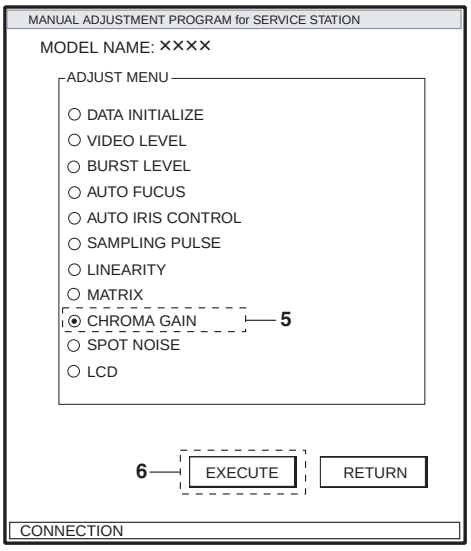


Fig. 6-4-4 White balance set screen

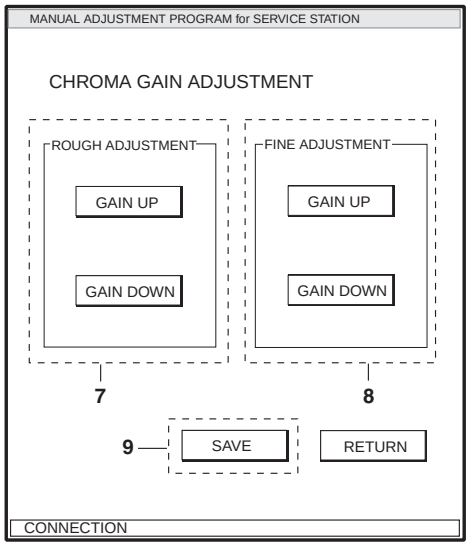
5) Choose CHROMA GAIN on the ADJUST MENU screen.
6) Click the EXECUTE button on ADJUST MENU screen to proceed with the CHROMA GAIN ADJUSTMENT screen.

ADJUST MENU screen



7) Click the GAIN UP or GAIN DOWN button in ROUGH ADJUSTMENT box so that the value of red vector or red level approaches that in Table 6-4-1. Click the button at approx. 2-second intervals while checking the increase or decrease of vector or level.
8) Click the GAIN UP or GAIN DOWN button in FINE ADJUSTMENT box so that the value of red vector or red level matches that in Table 6-4-1. Click the button at approx. 2-second intervals while checking any increase or decrease in vector or level.
9) After step 8) is complete, be sure to click the SAVE button.
   Note that clicking the RETURN button will restore the ADJUST MENU screen to the status before the adjustment was performed.
10) When save is complete, the ADJUSTMENT FINISHED dialog will appear: Click the OK button in dialog to restore the ADJUST MENU screen.
11) Press the MENU button on DVD video camera/recorder, and use the joystick to specify (return to) "White Bal.: Auto".

CHROMA GAIN ADJUSTMENT screen



ADJUSTMENT FINISHED dialog

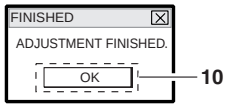


Table 6-4-1 Value of Red Level/Vector

Model	When using a vectorscope	When using an oscilloscope
DZ-GX20A	A = 240 % ± 5 %	B = 690mV ± 20 mVp-p
DZ-MV780A	A = 240 % ± 5 %	B = 690mV ± 20 mVp-p
DZ-MV730A	To be repoted	To be repoted

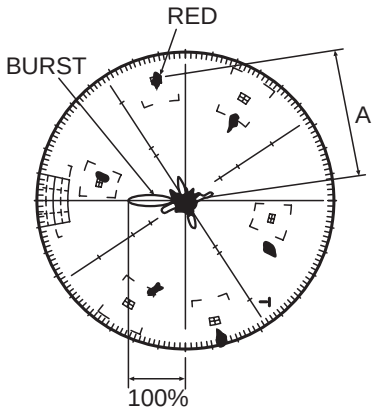


Fig. 6-4-5 When using a vectorscope

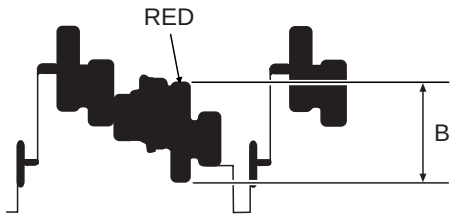


Fig. 6-4-6 When using an oscilloscope

6-4-10 Spot Noise

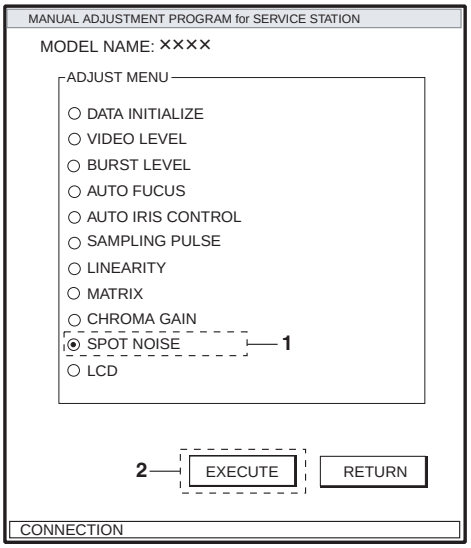
Information:

1) The SPOT NOISE adjustment compensates for bright points that appear on the screen, and these are caused by a defect in pixel of CCD image sensor that may occur when DVD video camera/ recorder is used under particular conditions or for a long time. Therefore, execute SPOT NOISE only in the following cases:
   a) Pixel defect occurs in CCD image sensor and a bright point appears on screen,
   b) CCD image sensor is replaced.
   c) "Initial Data Write" is executed
2) The presence or absence of a bright point that appears on screen due to pixel defect on CCD image sensor can easily be judged by capping the lens. Use a CRT color monitor for this check.

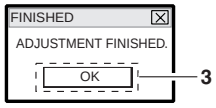
Procedure:

1) Choose SPOT NOISE on the ADJUST MENU screen.
2) Click the EXECUTE button on ADJUST MENU screen to start adjustment.
   When SPOT NOISE starts, the DVD video camera/ recorder will automatically turn on again.
3) When adjustment is complete, the ADJUSTMENT FINISHED dialog will appear: Click the OK button in dialog to restore the ADJUST MENU screen.
   If bright point still appears after adjustment is finished, the CCD image sensor may be faulty.

ADJUST MENU screen



ADJUSTMENT FINISHED dialog



6-4-11 LCD

Note:
1) Perform LCD only after replacing the MAN circuit board, LCD circuit board or LCD unit, or executing “Initial Data Write”.
2) Neither light box nor chart is needed for LCD adjustment.

Before performing any adjustments for LCD, be sure to shift the DVD video camera/recorder to the test mode using the procedure below, and then display the LCD ADJUSTMENT MENU.

Procedure:
1) Choose LCD on the ADJUST MENU screen.
2) Click the EXECUTE button on ADJUST MENU screen to shift the DVD video camera/recorder to the test mode. The progress status can be confirmed using the PROGRESS STATUS dialog.
3) When the DVD video camera/recorder has shifted to the test mode, the LCD screen will be black and white (see Fig. 6-4-7), and the LCD ADJUSTMENT MENU screen will appear on the PC monitor screen.

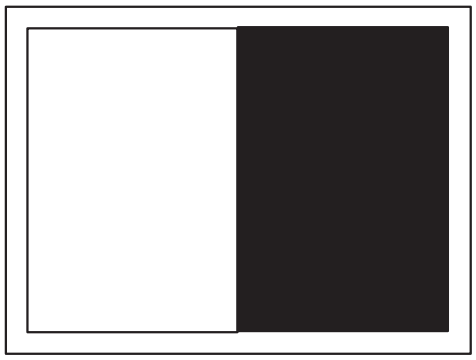
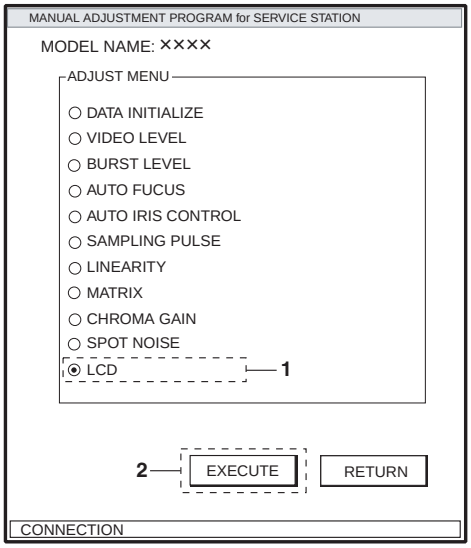
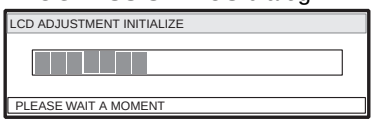


Fig. 6-4-7 LCD Monitor Screen

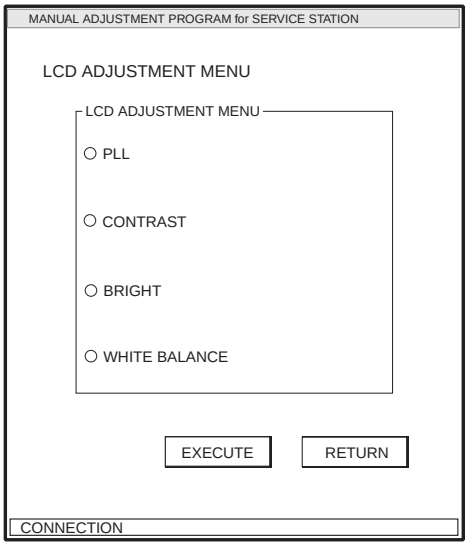
ADJUST MENU screen



PROGRESS STATUS dialog



LCD ADJUSTMENT MENU screen



(1) LCD PLL

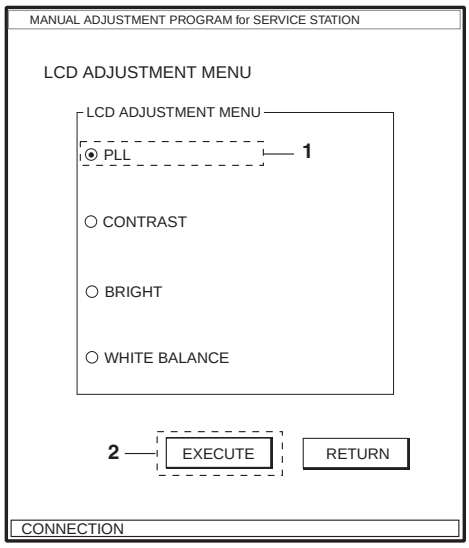
Preparation:

Connect the frequency counter to "LCD-HDO (pin 11)" of Halcyon connector.

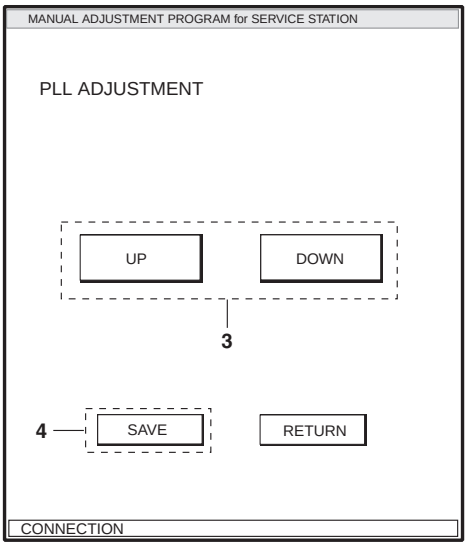
Procedure:

1) Choose PLL on the LCD ADJUSTMENT MENU screen.
2) Click the EXECUTE button on LCD ADJUSTMENT MENU screen to proceed with the PLL ADJUSTMENT screen.
   Synchronization of the video on LCD monitor screen will be off at this time, and the image will flow.
3) Click the UP or DOWN button so that the frequency is 15.734 kHz ± 0.1 kHz. Click the button at approx. 2-second intervals while checking the variation of frequencies.
4) After step 3) is complete, be sure to click the SAVE button.
   Note that clicking the RETURN button will restore the LCD ADJUSTMENT MENU screen to the status before the adjustment was performed.
5) When save is complete, the ADJUSTMENT FINISHED dialog will appear: Click the OK button in dialog to restore the LCD ADJUSTMENT MENU screen.

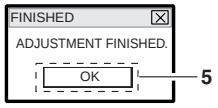
LCD ADJUSTMENT MENU screen



PLL ADJUSTMENT screen.



ADJUSTMENT FINISHED dialog



(2) LCD Contrast-1

Note:
Be sure to adjust LCD brightness and LCD contrast-2 after completing LCD contrast-1 adjustment.

Preparations:

1) Connect the oscilloscope CH2 to "LCD-G (pin 13)" of Halcyon connector.
2) Switch the oscilloscope V-MODE to "CH2": Leave the TRRIGER SOURCE in "CH1" as is.

Procedure

1) Choose CONTRAST on the LCD ADJUSTMENT MENU screen.
2) Click the EXECUTE button on LCD ADJUSTMENT MENU screen to proceed with the CONTRAST ADJUSTMENT screen.
3) Click the UP or DOWN button so that the value of level A of waveform is 2.20V ± 0.02Vp-p. Click the button at approx. 2-second intervals while checking any increase or decrease in level A.
4) After step 3) is complete, be sure to click the SAVE button.
   Note that clicking the RETURN button will restore the LCD ADJUSTMENT MENU screen to the status before the adjustment was performed.
5) When save is complete, the ADJUSTMENT FINISHED dialog will appear: Click the OK button in dialog to restore the LCD ADJUSTMENT MENU screen.

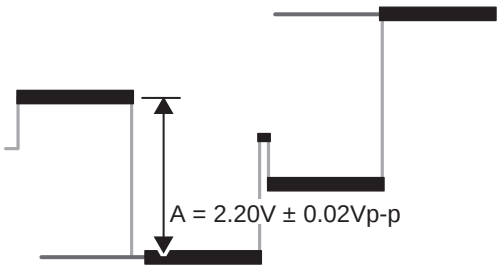
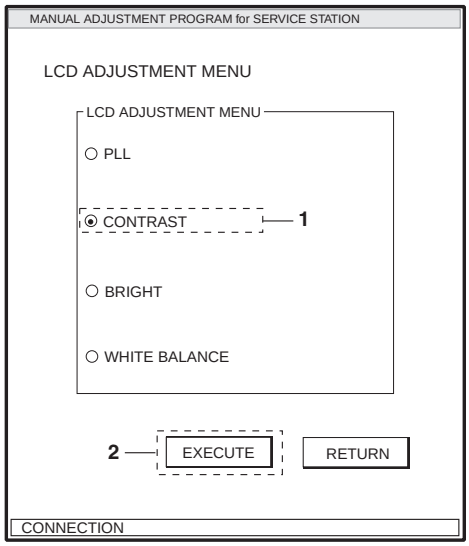
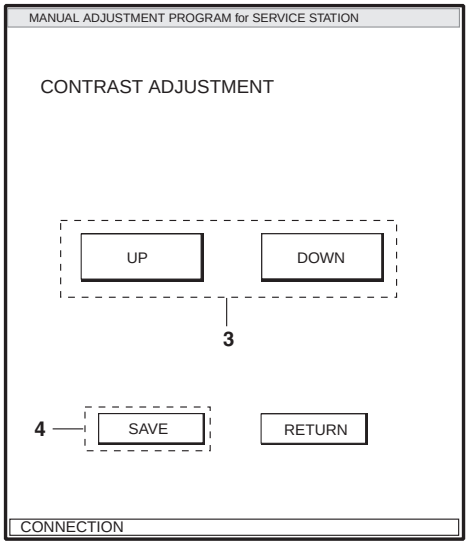


Fig. 6-4-8 Waveform of LCD Contrast-1 Adjustment

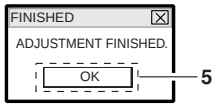
LCD ADJUSTMENT MENU screen



CONTRAST ADJUSTMENT screen



ADJUSTMENT FINISHED dialog



(3) LCD Brightness

Preparations:

1) Connect the oscilloscope CH2 to "LCD-G (pin 13)" of Halcyon connector.
2) Switch the oscilloscope V-MODE to "CH2": Leave the TRRIGER SOURCE in "CH1" as is.

Procedure:

1) Choose BRIGHT on the LCD ADJUSTMENT MENU screen.
2) Click the EXECUTE button on LCD ADJUSTMENT MENU screen to proceed with the BRIGHT ADJUSTMENT screen.
3) Click the UP or DOWN button so that the value of level B of waveform is 2.35V ± 0.1Vp-p. Click the button at approx. 2-second intervals while checking any increase or decrease in level B.
4) After step 3) is complete, be sure to click the SAVE button.
   Note that clicking the RETURN button will restore the LCD ADJUSTMENT MENU screen to the status before the adjustment was performed.
5) When save is complete, the ADJUSTMENT FINISHED dialog will appear: Click the OK button in dialog to restore the LCD ADJUSTMENT MENU screen.

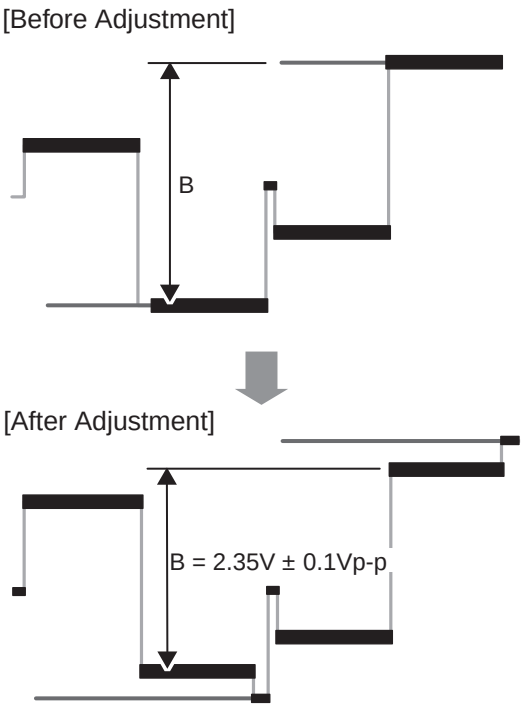
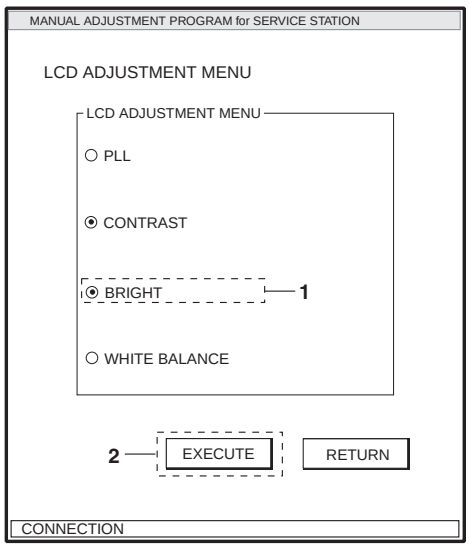
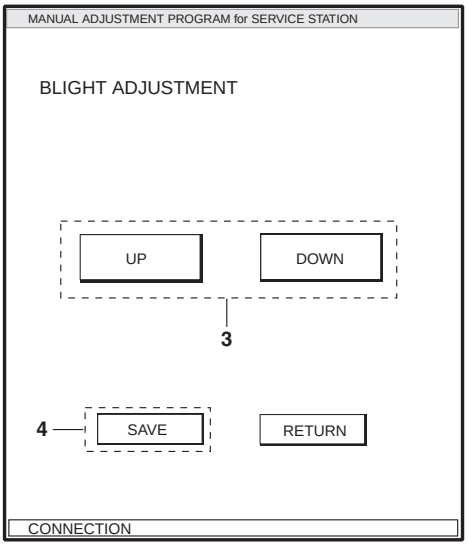


Fig. 6-4-9 Waveform of LCD Bright Adjustment

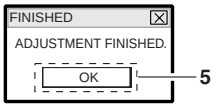
LCD ADJUSTMENT MENU screen



BRIGHT ADJUSTMENT screen



ADJUSTMENT FINISHED dialog



(4) LCD Contrast-2

Preparations:

1) Connect the oscilloscope CH2 to "LCD-G (pin 13)" of Halcyon connector.
2) Switch the oscilloscope V-MODE to "CH2": Leave the TRRIGER SOURCE in "CH1" as is.

Procedure

1) Choose CONTRAST on the LCD ADJUSTMENT MENU screen.
2) Click the EXECUTE button on LCD ADJUSTMENT MENU screen to proceed with the CONTRAST ADJUSTMENT screen.
3) Click the UP or DOWN button so that the value of level A of waveform is 2.00V ± 0.02Vp-p. Click the button at approx. 2-second intervals while checking any increase or decrease in level A.
4) After step 3) is complete, be sure to click the SAVE button.
   Note that clicking the RETURN button will restore the LCD ADJUSTMENT MENU screen to the status before the adjustment was performed.
5) When save is complete, the ADJUSTMENT FINISHED dialog will appear: Click the OK button in dialog to restore the LCD ADJUSTMENT MENU screen.

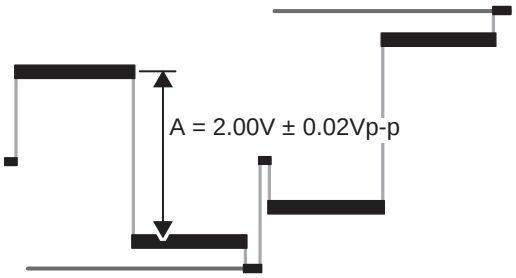
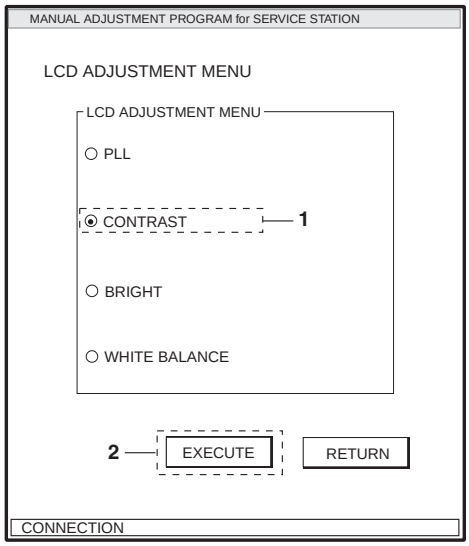
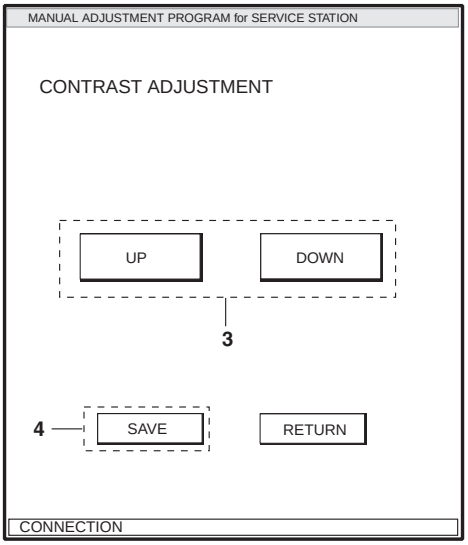


Fig. 6-4-10 Waveform of LCD Contrast-2 Adjustment

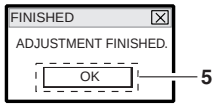
LCD ADJUSTMENT MENU screen



CONTRAST ADJUSTMENT screen



ADJUSTMENT FINISHED dialog



(5) LCD White Balance

Preparations:

1) Connect the oscilloscope CH1 to "LCD-R (pin 14)" of Halcyon connector.
2) Connect the oscilloscope CH2 to "LCD-G (pin 13)" of Halcyon connector.
3) Connect the oscilloscope EXT TRIG to video output.
4) Switch the oscilloscope V-MODE to "ALT" and TRIGGER SOURCE to "EXT".
5) Set the switches and knobs on oscilloscope so that the CH1 and CH2 waveforms appear as shown in Fig. 6-4-11.

Procedure

1) Choose WHITE BALANCE on the LCD ADJUSTMENT MENU screen.
2) Click the EXECUTE button on LCD ADJUSTMENT MENU screen to proceed with the SUB CONTRAST RED ADJUSTMENT screen.
3) Click the UP and DOWN buttons so that level a of CH1 waveform is equal to level b of CH2 waveform. Click the button at approx. 2-second intervals while checking any increase or decrease in level a.
4) After step 3) is complete, be sure to click the NEXT button, and then proceed with the SUB BRIGHT RED ADJUSTMENT screen.
   Note that clicking the RETURN button will restore the LCD ADJUSTMENT MENU screen to the status before the adjustment was performed.
5) Use the same procedure as in step 3) to equalize levels c and d of the waveform.
6) After step 5) is complete, be sure to click the NEXT button, and then proceed with the SUB CONTRAST BLUE ADJUSTMENT screen.

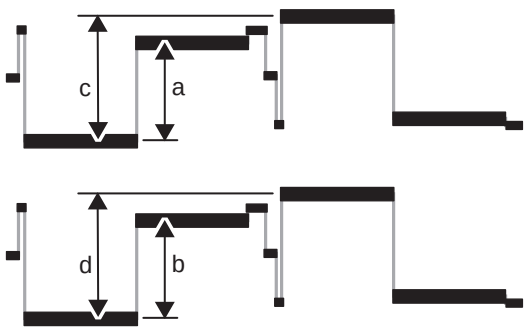
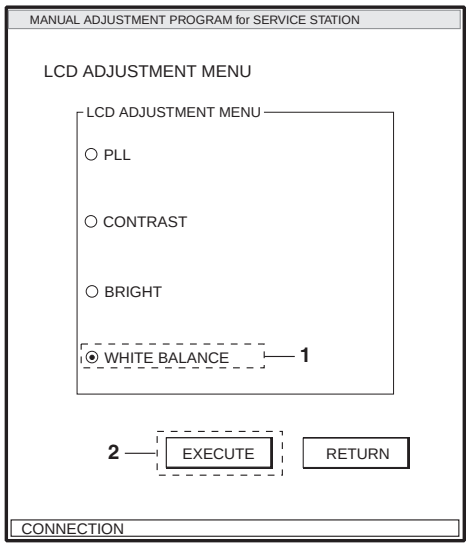
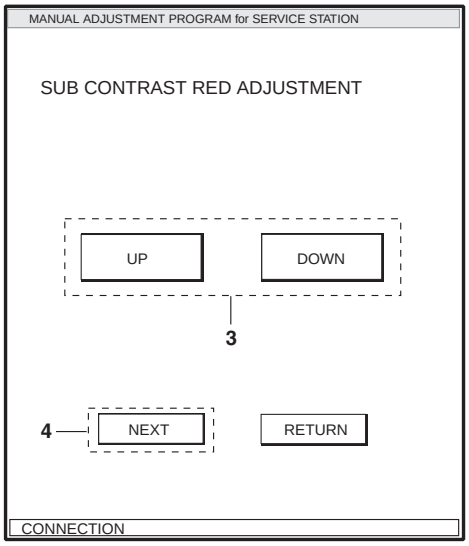


Fig. 6-4-11 Waveform of LCD White Balance Adjustment

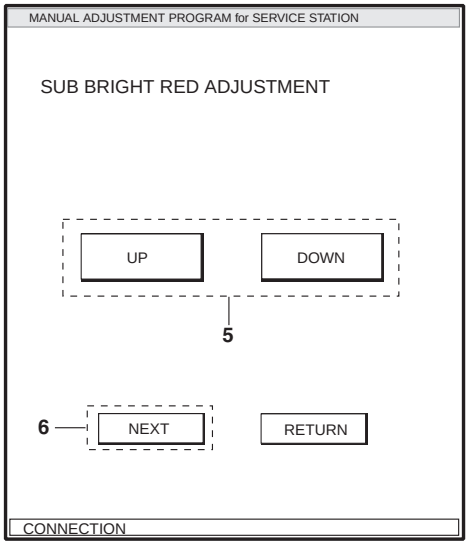
LCD ADJUSTMENT MENU screen



SUB CONTRAST RED ADJUSTMENT screen.

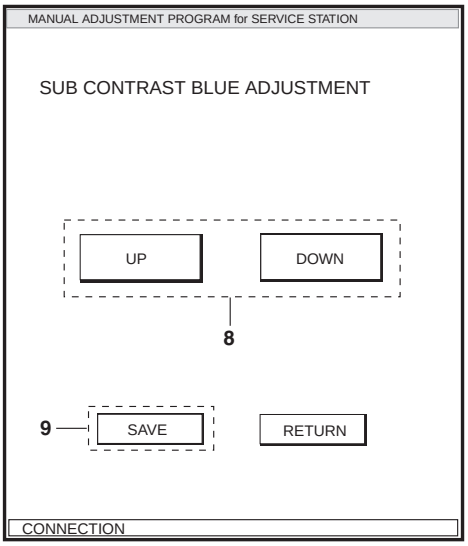


SUB BRIGHT RED ADJUSTMENT screen.

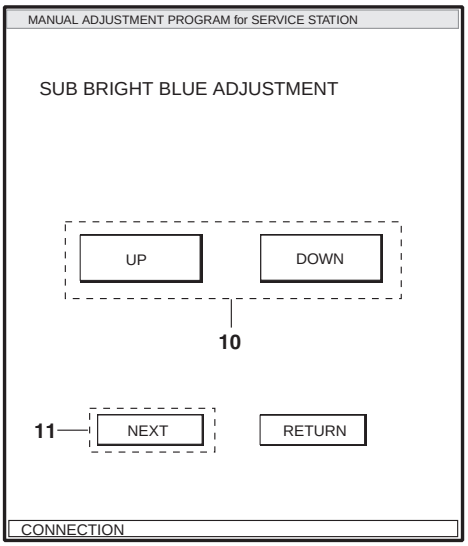


7) Connect the oscilloscope CH1 to “LCD-B (pin 12)” of Halcyon connector.
8) Use the same procedure as in step 3) to equalize levels a and b of the waveform. (See Fig. 6-4-11)
9) After step 8) is complete, be sure to click the NEXT button, and then proceed with the SUB BRIGHT BLUE ADJUSTMENT screen.
10) Use the same procedure as in step 3) to equalize levels c and d of the waveform.
11) After step 10) is complete, be sure to click the SAVE button.
12) When save is complete, the ADJUSTMENT FINISHED dialog will appear: Click the OK button in dialog to restore the LCD ADJUSTMENT MENU screen.
13) Click the RETURN button in LCD ADJUSTMENT MENU to restore the ADJUST MENU screen.

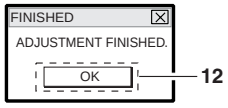
SUB CONTRAST BLUE ADJUSTMENT screen.



SUB BRIGHT BLUE ADJUSTMENT screen.



ADJUSTMENT FINISHED dialog

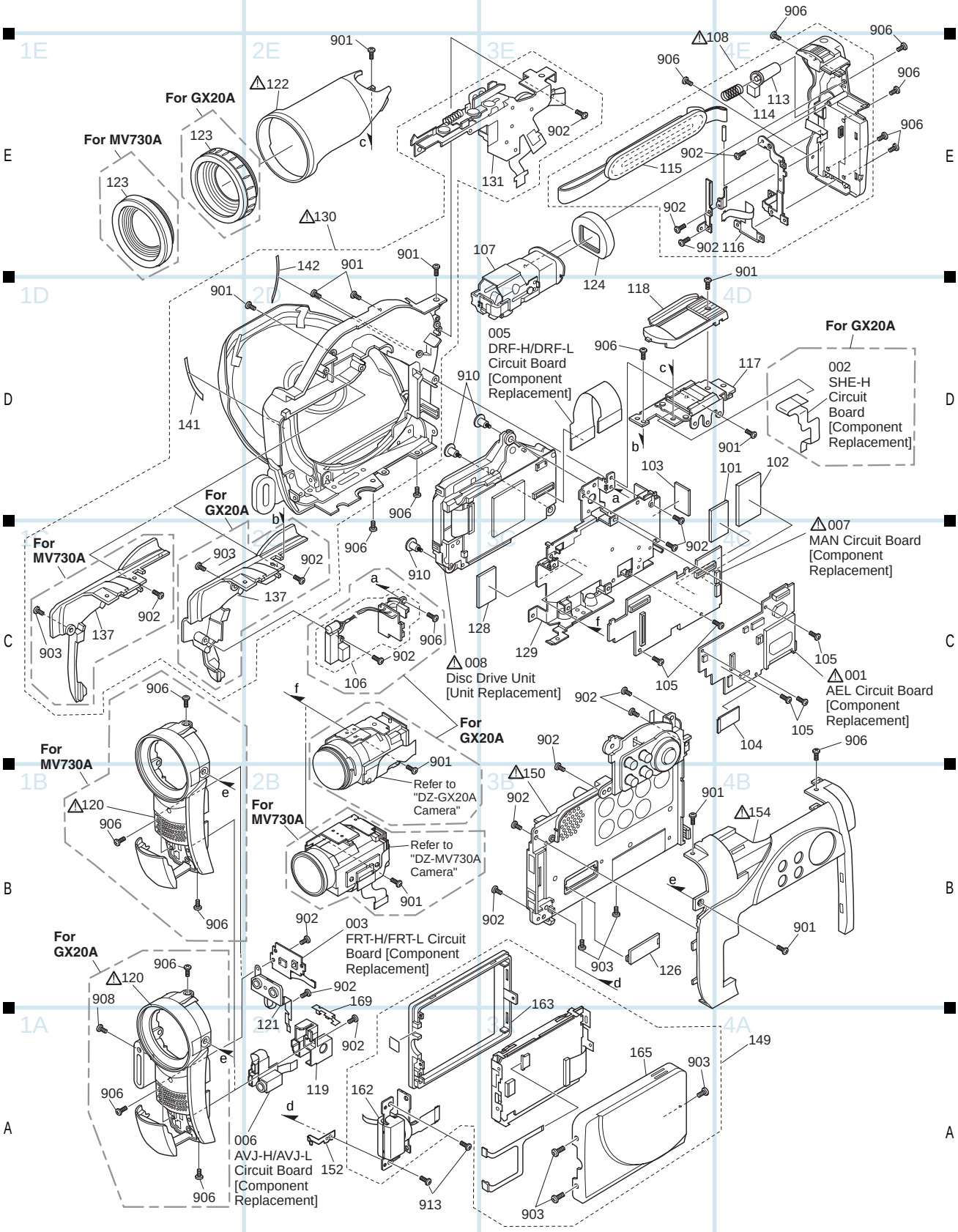


7 Exploded View

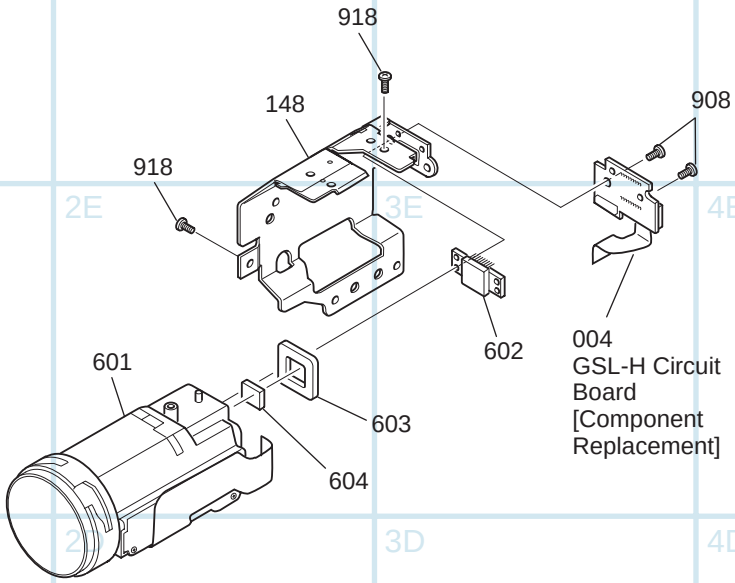
7-1 Exploded Views

7-1-1 DZ-GX20A/MV730A Main

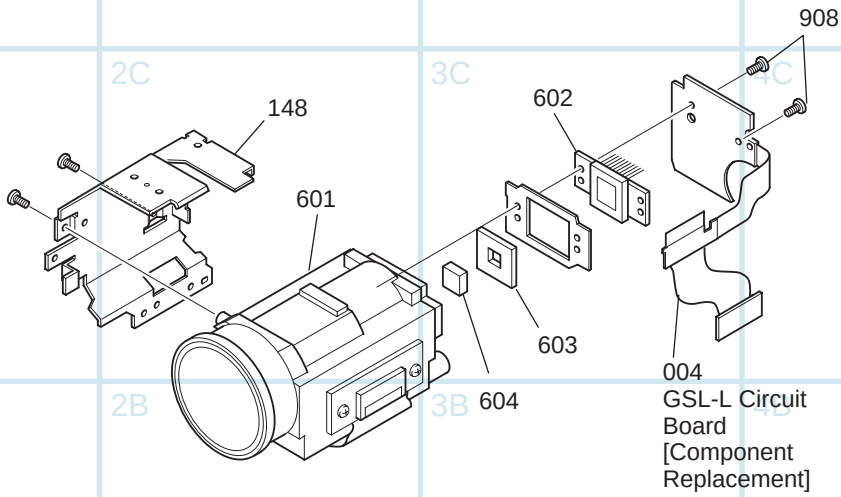
Note: Components without any numbers in exploded views had not been assigned as service parts as of the date of issue of this manual.


For GX20A
For MV730A
005 DRF-H/DRF-L Circuit Board [Component Replacement]
002 SHE-H Circuit Board [Component Replacement]
007 MAN Circuit Board [Component Replacement]
008 Disc Drive Unit [Unit Replacement]
001 AEL Circuit Board [Component Replacement]
003 FRT-H/FRT-L Circuit Board [Component Replacement]
006 AVJ-H/AVJ-L Circuit Board [Component Replacement]
Refer to "DZ-GX20A Camera"
Refer to "DZ-MV730A Camera"

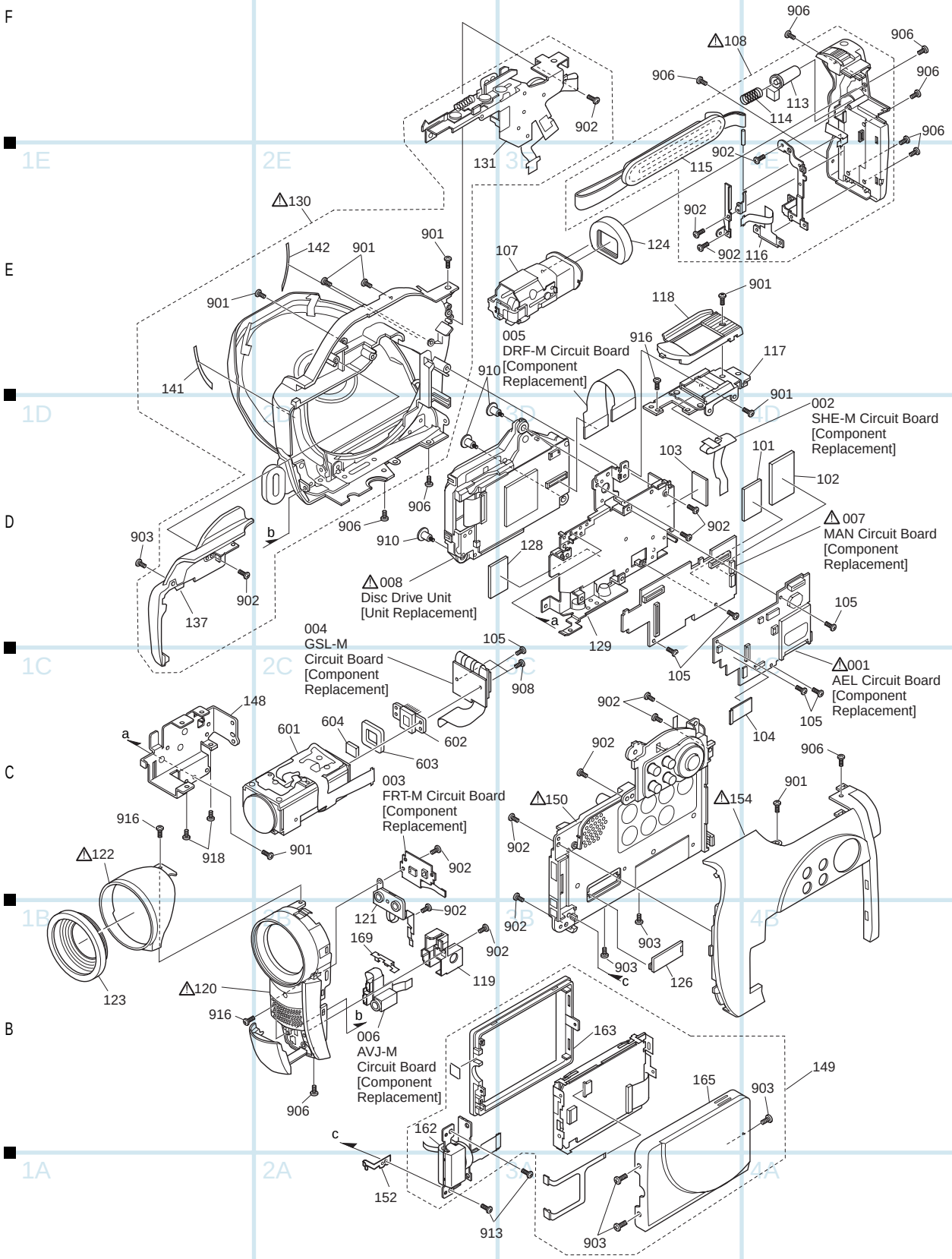
7-1-2 DZ-GX20A Camera



7-1-3 DZ-MV730A Camera

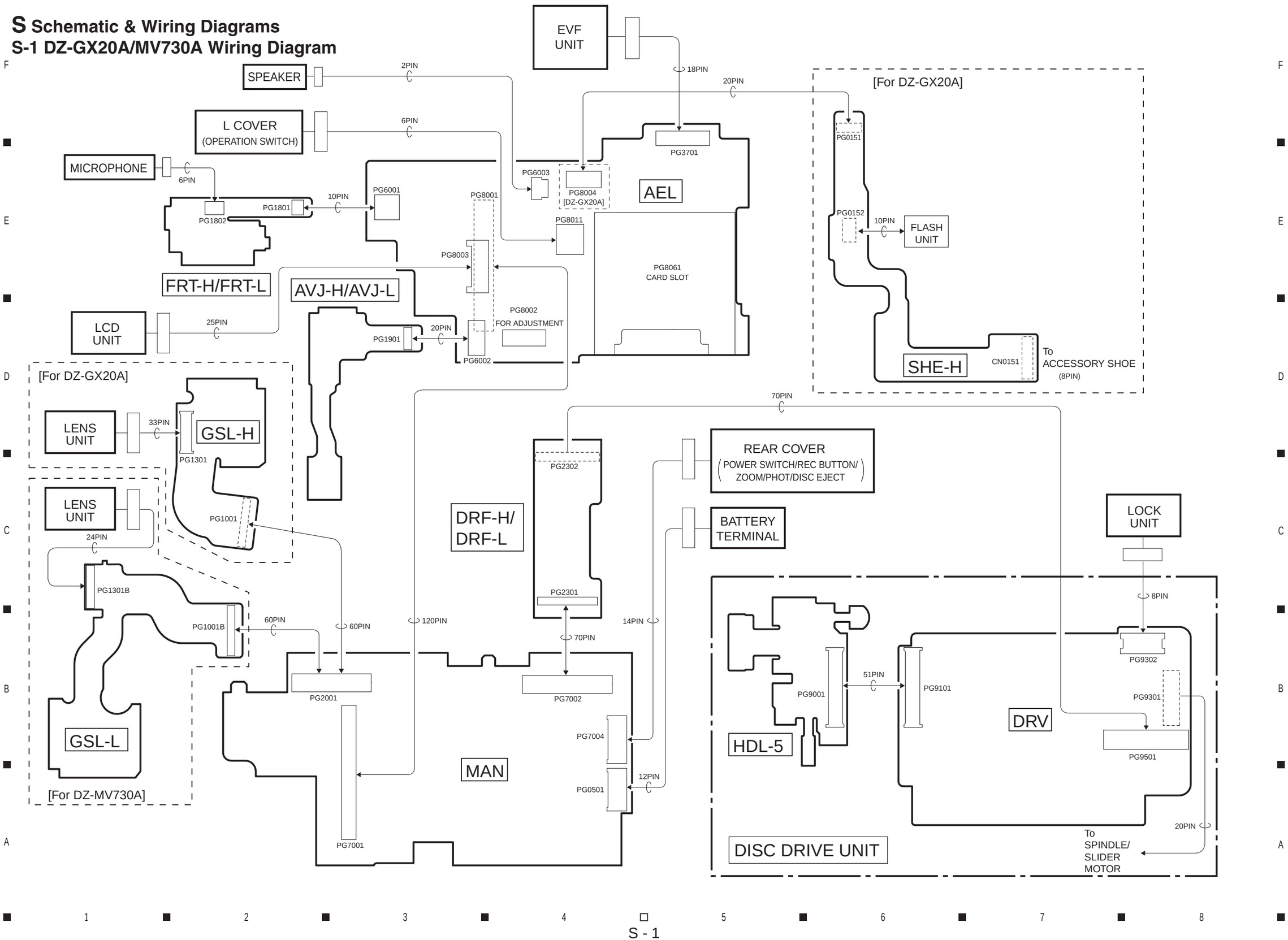


7-1-4 DZ-MV780A

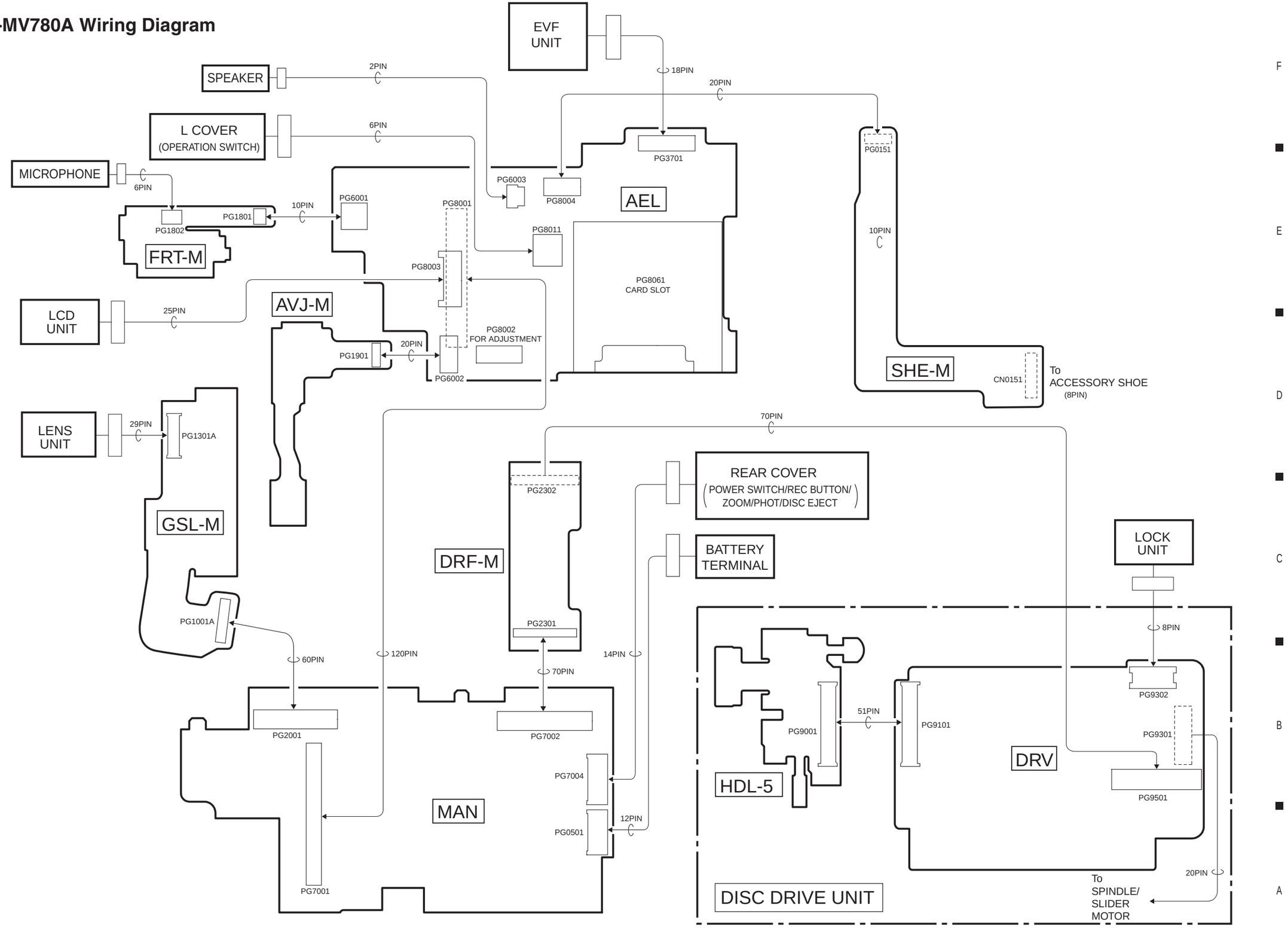


S Schematic & Wiring Diagrams

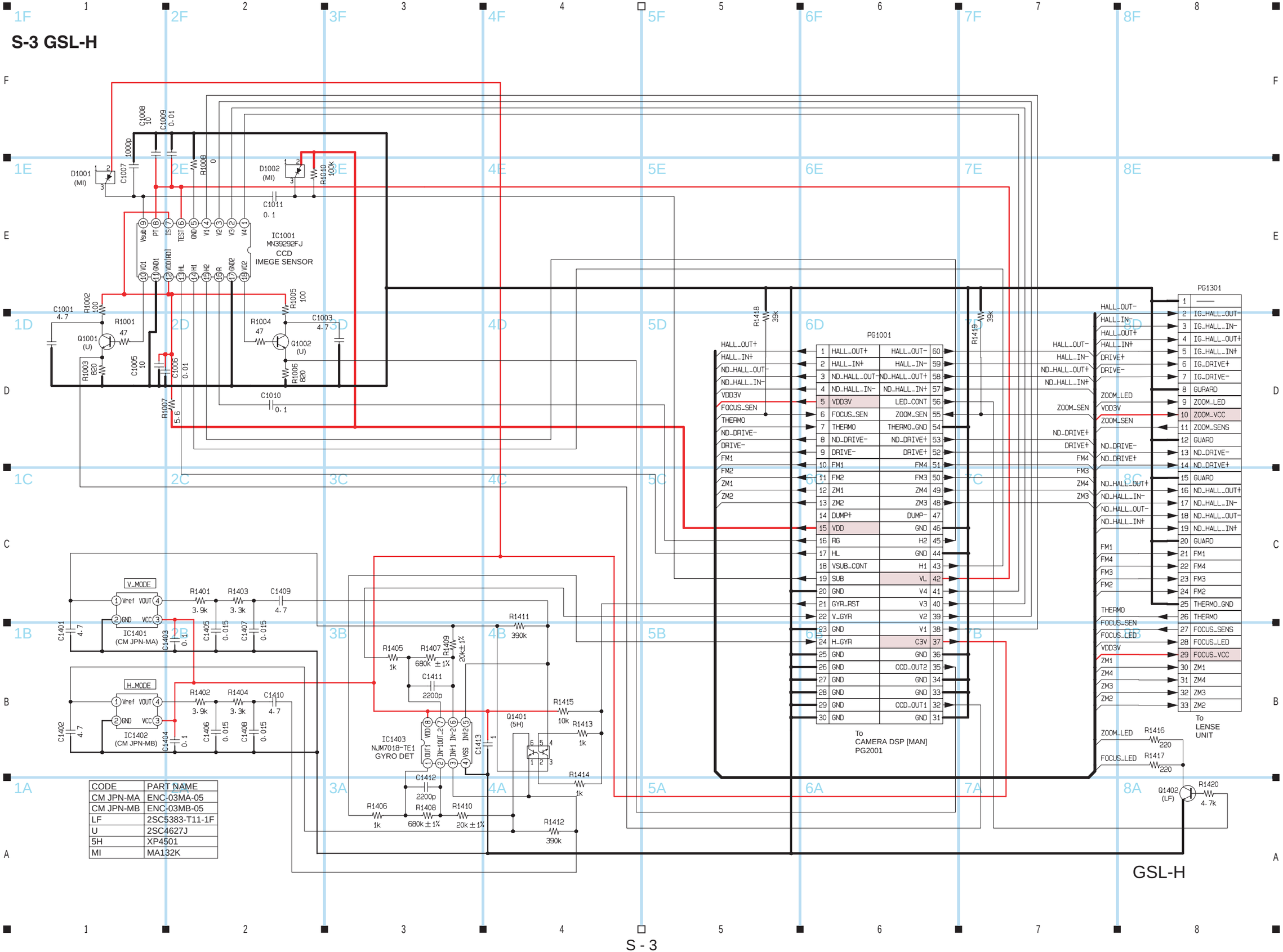
S-1 DZ-GX20A/MV730A Wiring Diagram



S-2 DZ-MV780A Wiring Diagram

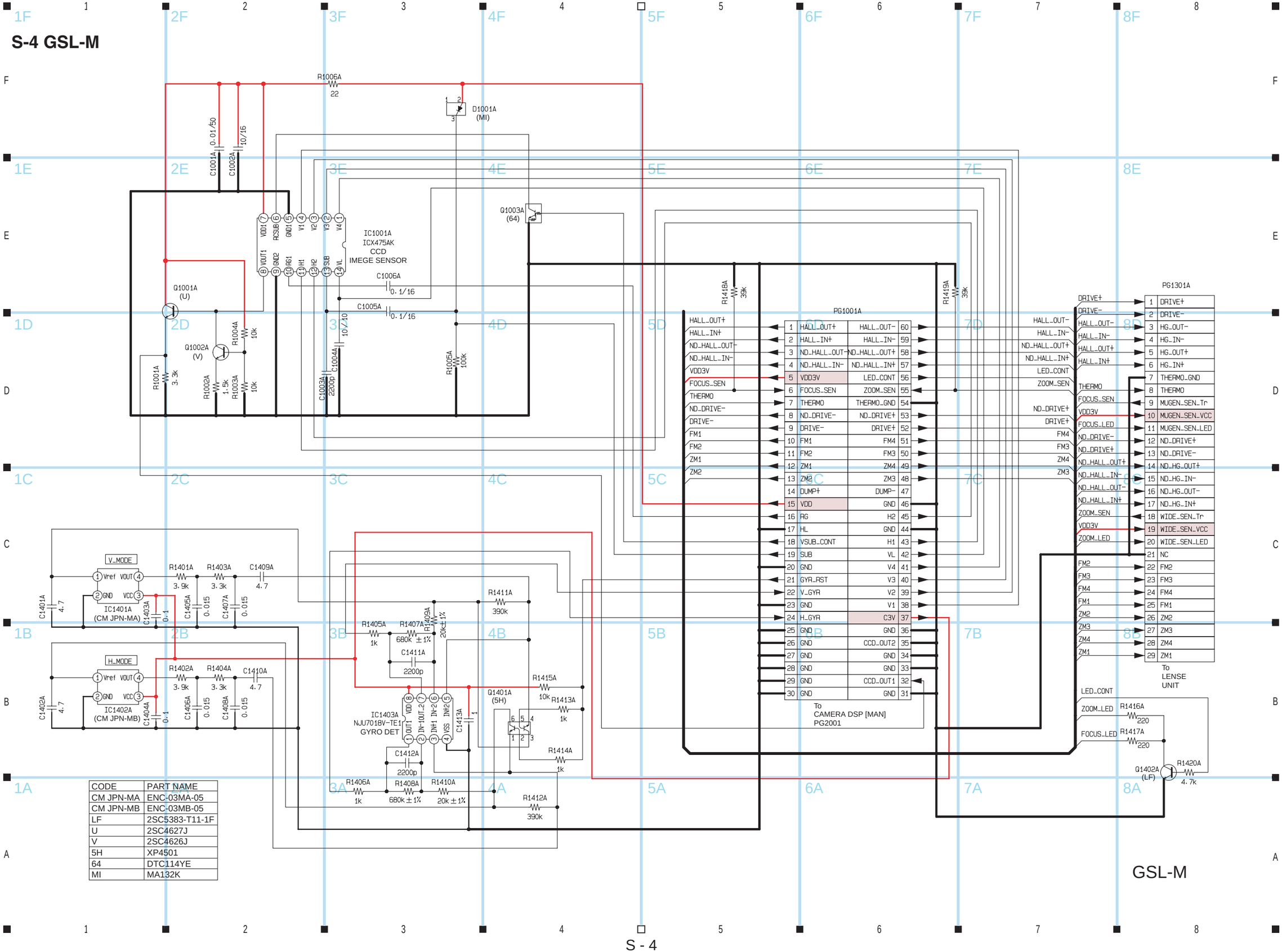


S-3 GSL-H



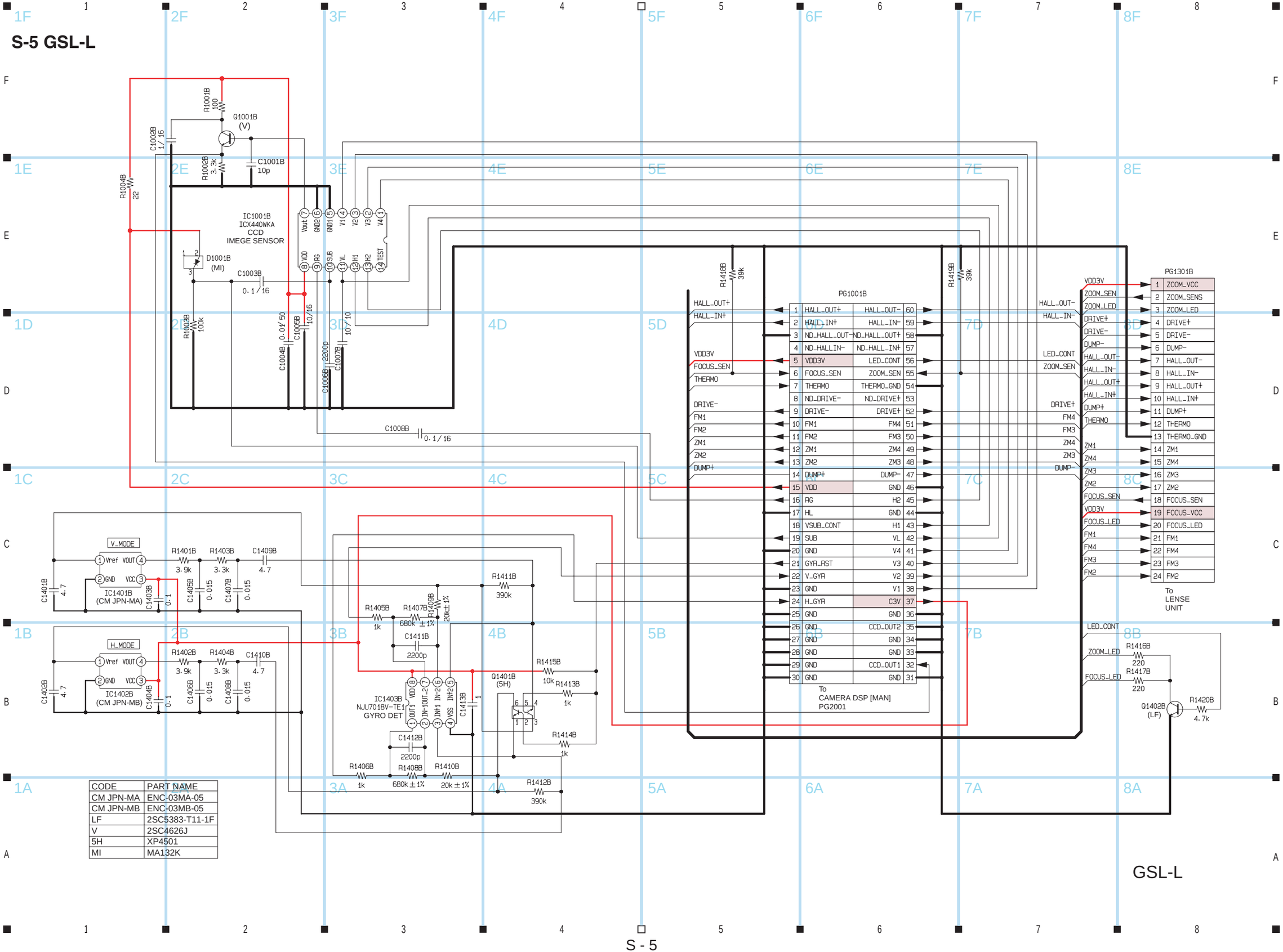
CODE	PART NAME
CM JPN-MA	ENC-03MA-05
CM JPN-MB	ENC-03MB-05
LF	2SC5383-T11-1F
U	2SC4627J
5H	XP4501
MI	MA132K

S-4 GSL-M



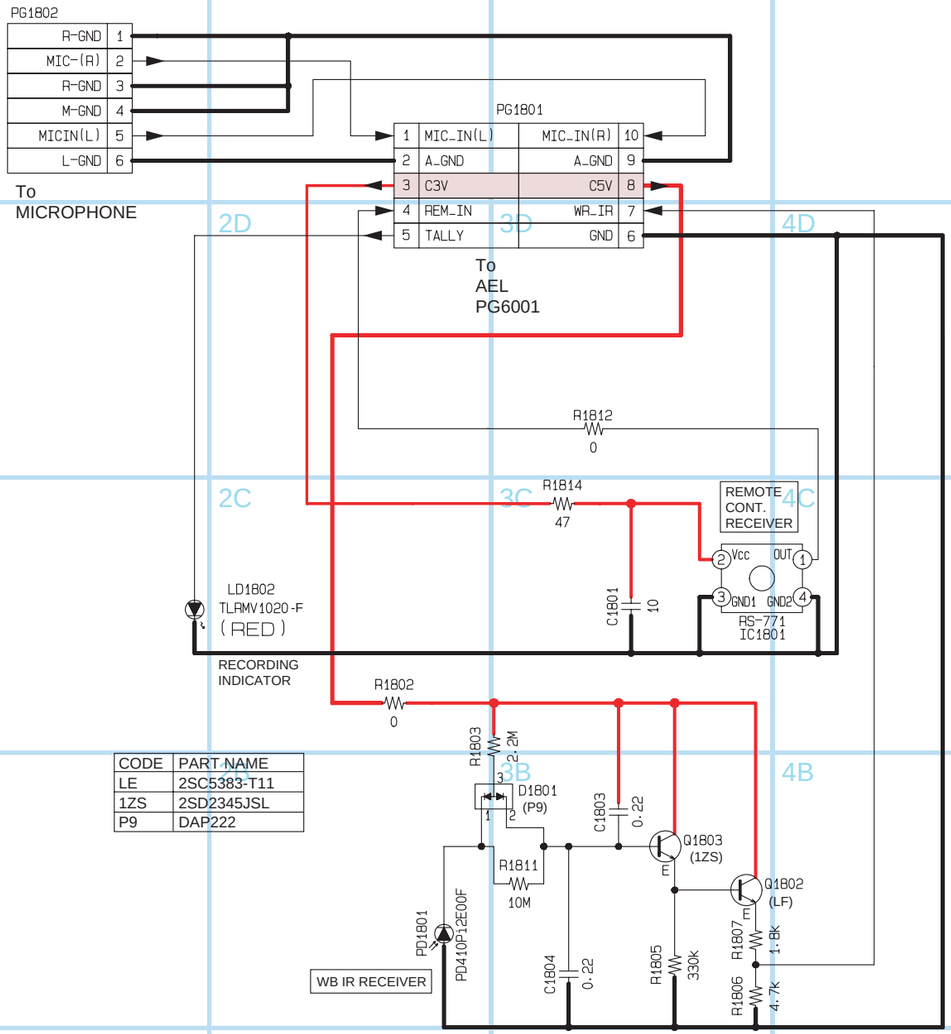
CODE	PART NAME
CM JPN-MA	ENC-03MA-05
CM JPN-MB	ENC-03MB-05
LF	2SC5383-T11-1F
U	2SC4627J
V	2SC4626J
5H	XP4501
64	DTC114YE
MI	MA132K

S-5 GSL-L



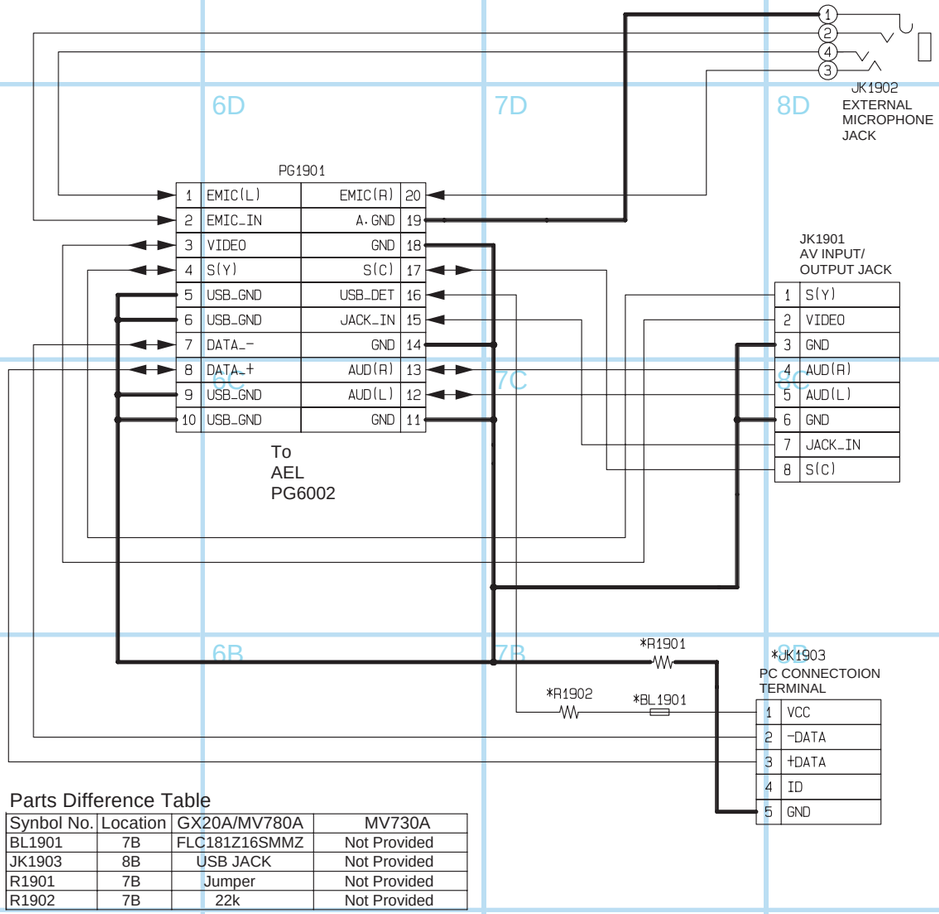
CODE	PART NAME
CM JPN-MA	ENC-03MA-05
CM JPN-MB	ENC-03MB-05
LF	2SC5383-T11-1F
V	2SC4626J
5H	XP4501
MI	MA132K

S-6 FRT-H/FRT-M/FRT-L



CODE	PART NAME
LE	2SC5383-T11
1ZS	2SD2345JSL
P9	DAP222

S-7 AVJ-H/AVJ-M/AVJ-L



Parts Difference Table

Synbol No.	Location	GX20A/MV780A	MV730A
BL1901	7B	FLC181Z16SMMZ	Not Provided
JK1903	8B	USB JACK	Not Provided
R1901	7B	Jumper	Not Provided
R1902	7B	22k	Not Provided

FRT-H
FRT-M
FRT-L

AVJ-H
AVJ-M
AVJ-L

S-8 SHE-H

CN0151

SHOE_GND	1
MIC(L)	2
MIC_GND	3
MIC(R)	4
SHOE_DET	5
SHOE_CLK	6
SHOE_SDA	7
SHOE_UNR	8

To ACCESSORY SHOE

CN0153

1	To SHASSIS

PG0152

10	GND	STB_RDY	1
9	STB_FANA	STB_ON	2
8	STB_OSCI	C5V	3
7	STB_+B	STB_GND	4
6	STB_+B	STB_GND	5

To FLASH UNIT

C0153 10

C0154 10

C0152 1

L0151 1

PG0151

20	SHOE_DATA	MIC(L)	1
19	SHOE_SCLK	A.GND	2
18	SHOE_DET	MIC(R)	3
17	SHOE_GND	SHOE_REG	4
16	SHOE_GND	SHOE_REG	5
15	SHOE_GND	STB_+B	6
14	GND	STB_+B	7
13	C5V	STB_+B	8
12	STB_FANA	STB_OSCI	9
11	STB_ON	STB_RDY	10

To AEL PG8004

S-9 SHE-M

CN0151

SHOE_GND	1
MIC(L)	2
MIC_GND	3
MIC(R)	4
SHOE_DET	5
SHOE_CLK	6
SHOE_SDA	7
SHOE_UNR	8

To ACCESSORY SHOE

PG0151

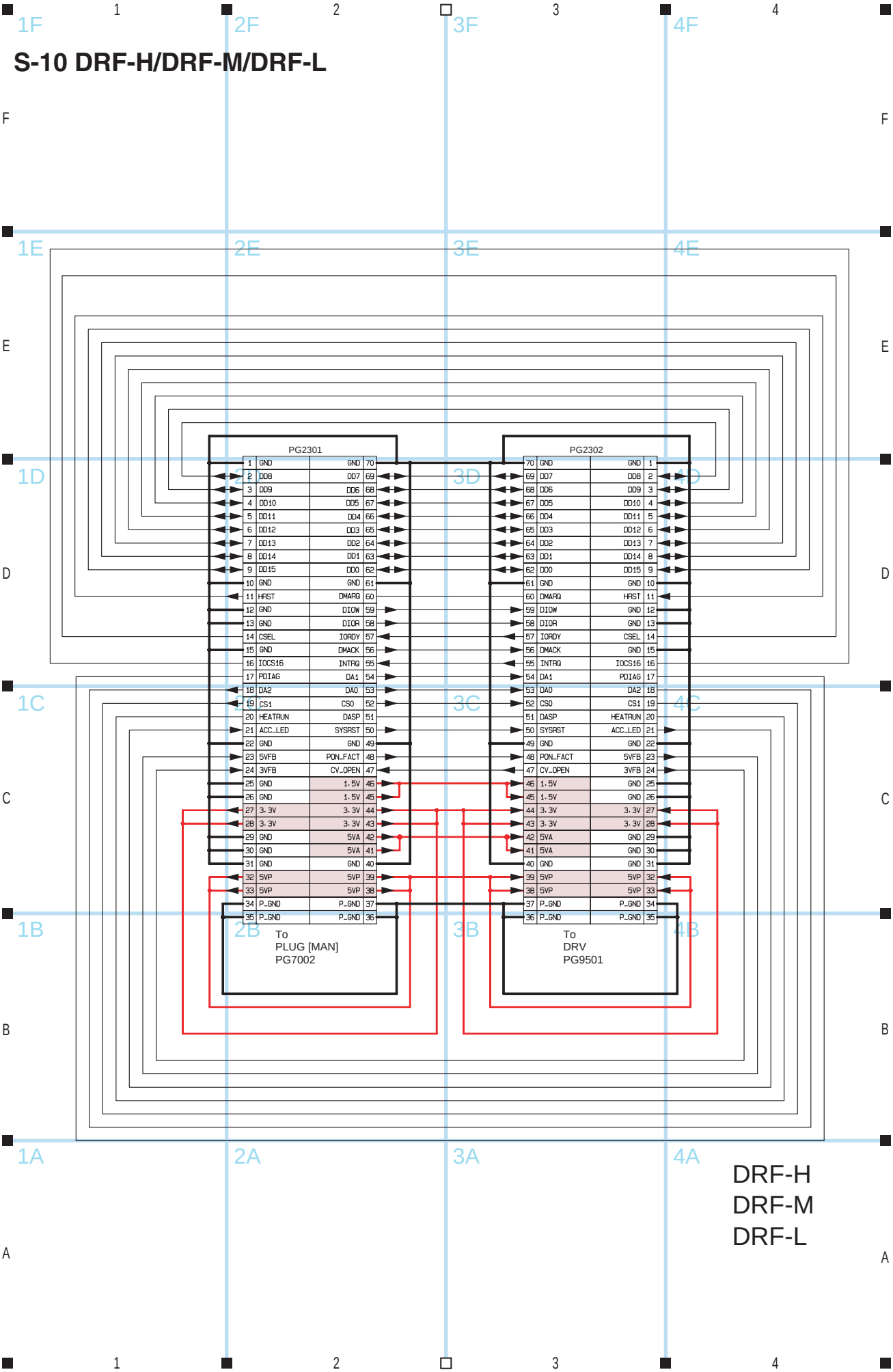
20	SHOE_DATA	MIC(L)	1
19	SHOE_SCLK	A.GND	2
18	SHOE_DET	MIC(R)	3
17	SHOE_GND	SHOE_REG	4
16	SHOE_GND	SHOE_REG	5
15	SHOE_GND	STB_+B	6
14	GND	STB_+B	7
13	C5V	STB_+B	8
12	STB_FANA	STB_OSCI	9
11	STB_ON	STB_RDY	10

To AEL PG8004

SHE-H

SHE-M

S-10 DRF-H/DRF-M/DRF-L



S-11 AEL

Note: Components marked ⍙ are different between DZ-GX20A, DZ-MV780A and DZ-MV730A: Refer to the "Parts Difference Table" for the different components.

Parts Difference Table

Symbol No.	Location	GX20A/MV780A	MV730A
BL5001	8D	BLM15AG700SN1D	Not Provided
BL5002	8E	BLM15AG700SN1D	Not Provided
BL5003	7E	Jumper	Not Provided
BL5004	7E	BLM15AG700SN1D	Not Provided
BL8010	8F	BLM11B550SAPT	Not Provided
C5001	8D	10	Not Provided
C5002	8E	10	Not Provided
C5003	8E	0.01	Not Provided
C5005	7D	0.01	Not Provided
C5006	7D	4.7	Not Provided
C5007	7D	0.01	Not Provided
C5008	8D	0.01	Not Provided
C5009	7D	15P	Not Provided
C5010	7D	15P	Not Provided
C5011	7D	0.01	Not Provided
C5012	7D	0.01	Not Provided
C5013	8D	0.01	Not Provided
C5014	7D	0.01	Not Provided
C6027	3B	1	Not Provided
C6029	3B	0.1	Not Provided
C8011	8F	1000P	Not Provided
CP5001	7D	BM10631R	Not Provided
IC5001	8D	M66592WG	Not Provided
IC6021	3B	MM1503XNRE-LF	Not Provided
PG8004	8F	20P	Not Provided
Q6027	3B	Not Provided	(CL) 2SC5343E-CL
Q6028	3B	(CL) 2SC5343E-CL	Not Provided
Q6029	3B	(CL) 2SC5343E-CL	Not Provided
Q6031	3B	(CL) 2SC5343E-CL	Not Provided
Q8001	8F	(TX) RTR020P02TL	Not Provided
Q8002	8E	(N5)RT1N144U-T11-1	Not Provided
R5001	8E	Jumper	Not Provided
R5002	7D	Jumper	Not Provided
R5003	7D	5.6k 1%	Not Provided
R5004	7D	1M	Not Provided
R5005	7D	1K	Not Provided
R6027	3B	560	Not Provided
R6031	3B	100k	Not Provided
R6032	3A	100k	Not Provided
R6033	3A	2.2k	Not Provided
R6035	3B	Not Provided	100k
R6036	3B	Not Provided	100k
R6037	3B	Not Provided	1k
R6039	3B	1.5k	Not Provided
R6041	3A	1.5k	Not Provided
R8001	7E	1k	Not Provided
R8002	7E	1k	Not Provided
R8003	7F	1k	Not Provided
R8004	7E	Jumper	Not Provided
R8005	8F	470k	Not Provided
R8006	8E	220k	Not Provided
X5001	7D	24MHz	Not Provided
ZD8001	8E	EDZTE6113B	Not Provided

CODE	PART NAME
AY	2SA1980EF-AY
CL	2SC5343E-CL
TX	RTR020P02TL
N2	RT1N241U-T11-1
N5	RT1N144U-T11-1
P5	RT1P144U-T11-1
7D	MUN5214DW1T1
3X	SUT483J
MI	MA132K

One voltage : PB or REC mode.
Two voltages : PB and (REC) mode.

S-12 CAMERA DSP [MAN]

Note: Components marked * are different between DZ-GX20A, DZ-MV780A and DZ-MV730A: Refer to the "Parts Difference Table" for the different components.

Parts Difference Table

Symbol No.	Location	GX20A	MV780A	MV730A
C2001	2D	1000p	Not Provided	Not Provided
C2003	2D	2.2	Not Provided	Not Provided
C2009	2D	0.1	Not Provided	Not Provided
C2011	2D	0.1	Not Provided	Not Provided
C2012	2D	0.1	Not Provided	Not Provided
C2014	3D	0.01	Not Provided	Not Provided
C2015	2E	27p	27p	Not Provided
C2017	2A	0.01	Not Provided	Not Provided
C2018	2E	1	1	Not Provided
C2020	2D	22	Not Provided	Not Provided
C2038	3A	33p	Not Provided	Not Provided
C2041	3B	10p	Not Provided	10p
C2042	3B	10p	Not Provided	Not Provided
C2090	2D	10	Not Provided	Not Provided
C2092	2A	1	Not Provided	Not Provided
D2004	6F	(C)RB521S-30	(C)RB521S-30	Not Provided
IC2001	2B	SN74ALVC04PWR	SN74ALVC04PWR	SN74LVC04APWR-ZF
IC2002	2E	HD49343HNP	HD49343HNP	HD49343NP
IC2003	2D	HD49343HNP	Not Provided	Not Provided
IC2008	2A	NJM2872AF-34	Not Provided	Not Provided
L2000	2A	Not Provided	4.7	4.7
L2001	2E	33	33	Not Provided
L2003	3E	4.7	10	10
R2000	2E	1k	1k	Not Provided
R2001	3B	56	56	Jumper
R2006	2D	56	Not Provided	Not Provided
R2009	2D	56	Not Provided	Not Provided
R2010	2D	47	Not Provided	Not Provided
R2011	2B	6.8	2.7	10
R2012	2A	Jumper	Not Provided	Not Provided
R2013	2B	22	Not Provided	Not Provided
R2014	3A	Not Provided	Jumper	Jumper
R2015	3B	6.8	4.7	10
R2017	2D	33k	Not Provided	Not Provided
R2043	6F	1k	1k	Not Provided
R2062	4B	47k	47k	Not Provided
R2063	4C	1k	1k	Not Provided
R2064	4C	1k	1k	Not Provided
R2065	5B	220k	220k	Not Provided
R2066	5B	1k	1k	Not Provided

CODE	PART NAME
TR	2SA1989-T11-1R
SS	SUT485J
N5	RT1N144U-T11-1
P5	RT1P144U-T11-1
C	RB521S-30
P1	SDS7000EF

One voltage : PB or REC mode.
Two voltages : PB and (REC) mode.

To LENS DRIVE 16A-38A

To REG 1G-9G

To CODEC 11B,12B

To LENS DRIVE 1A-4A

To GSL-H / GSL-M / GSL-L PG1001/PG1001A/PG1001B

To CODEC 13B-31B

To CODEC 1B-10B

To LENS DRIVE 5A-15A

To PLUG 1C-5C

To PLUG 6C-17C

IC2006

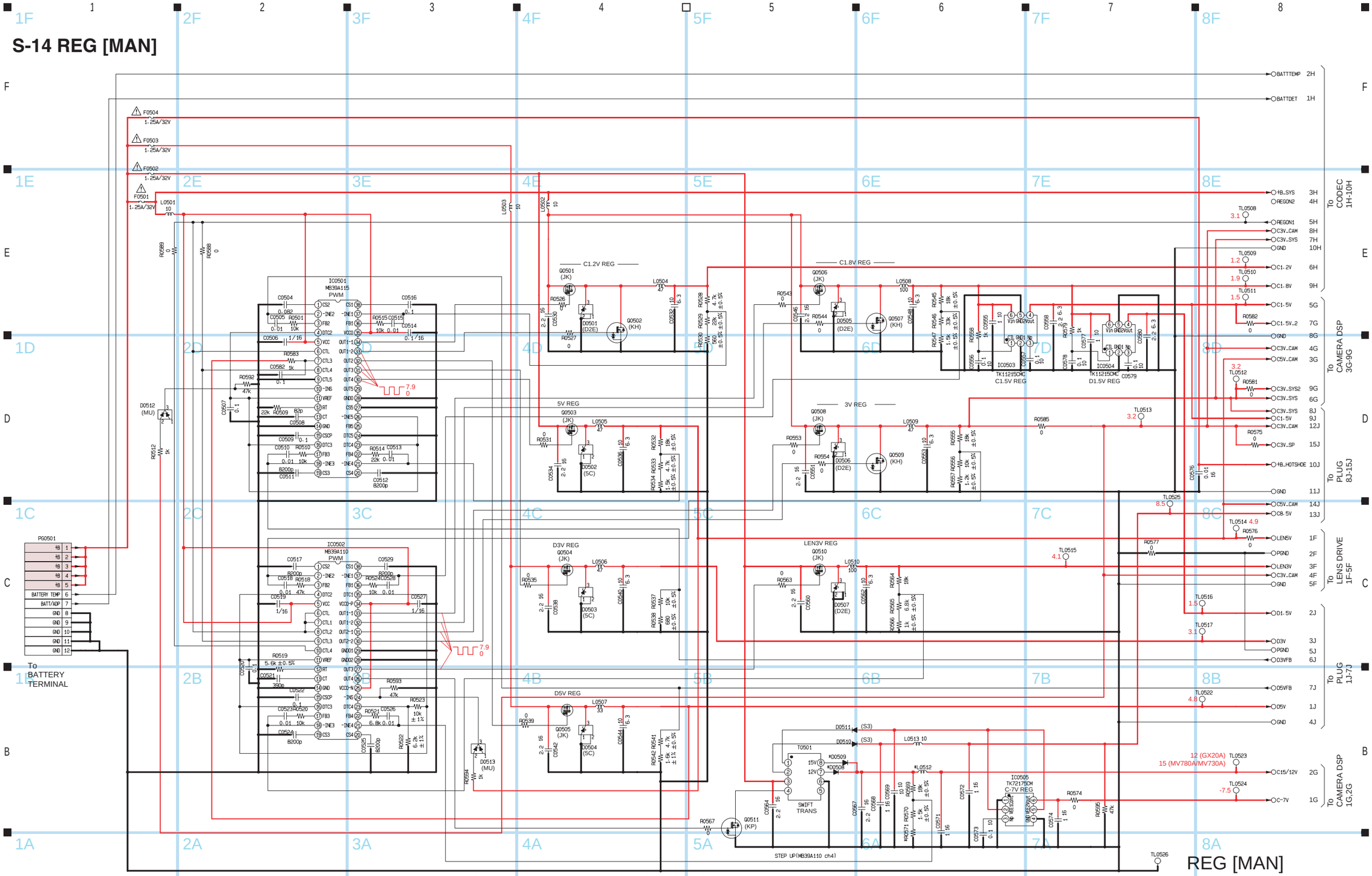
CAMERA DSP [MAN]

S-13 CODEC [MAN]

CODE	PART NAME
B8	HVC375B

CODEC [MAN]

S-14 REG [MAN]



CODE	PART NAME
JK	MCH3310-TL
KH	MCH3408
D2E	RB491D
MU	MA132WK
S3	1SS388
5C	SBS004
KP	MCH3414

One voltage : PB or REC mode.
Two voltages : PB and (REC) mode.

Note: Components marked * are different between DZ-GX20A, DZ-MV780A and DZ-MV730A: Refer to the "Parts Difference Table" for the different components.

Parts Difference Table

Synbol No.	Location	GX20A	MV780A	MV730A
D0508	5B	(S3) 1SS388	Not Provided	Not Provided
D0509	5B	Not Provided	(S3) 1SS388	(S3) 1SS388
L0512	6B	100	10	10
R0571	6A	560 ±0.5%	110 ±1%	110 ±1%

REG [MAN]

S-15 PLUG [MAN]

To REAR CASE

To CODEC 1D-10D,76D-85D

To REG 1J-7J

To DRF-H/DRF-M/DRF-L PG2301

To CODEC 11D-75D

To AEL PG8001

To REG 8J-15J

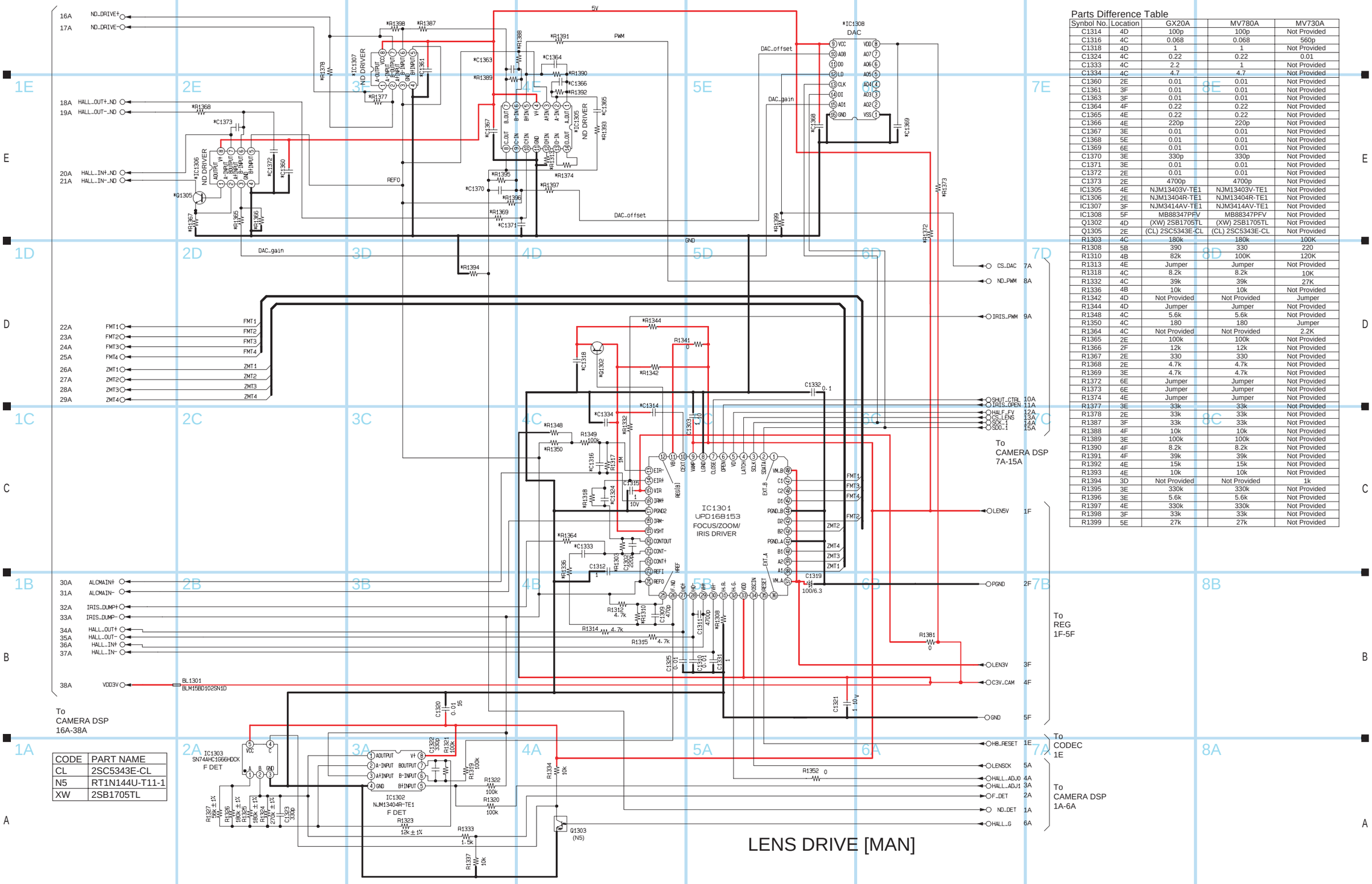
To CAMERA DSP 1C-17C

CODE	PART NAME
N5	RT1N144U-T-11-1

One voltage : PB or REC mode.
Two voltages : PB and (REC) mode.

PLUG [MAN]

S-16 LENS DRIVE [MAN]



CODE	PART NAME
CL	2SC5343E-CL
N5	RT1N144U-T11-1
XW	2SB1705TL

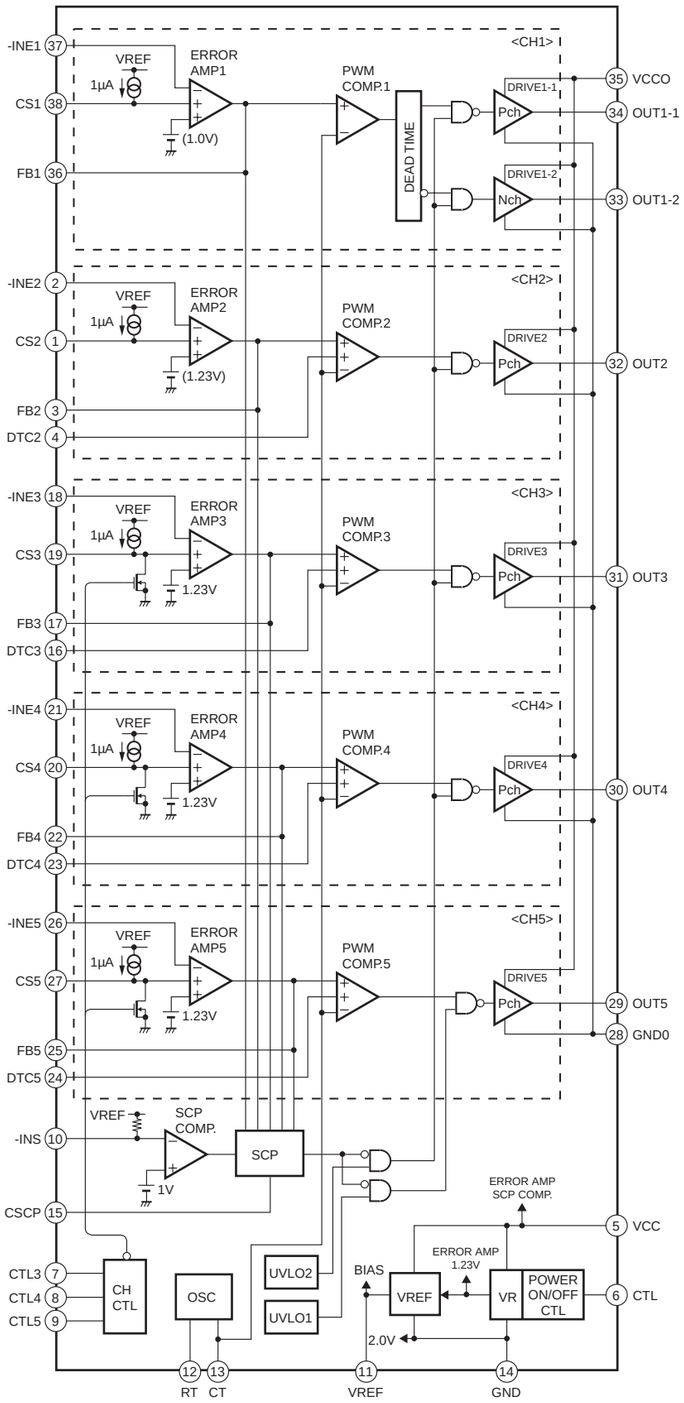
Note: Components marked * are different between DZ-GX20A, DZ-MV780A and DZ-MV730A: Refer to the "Parts Difference Table" for the different components.

Parts Difference Table

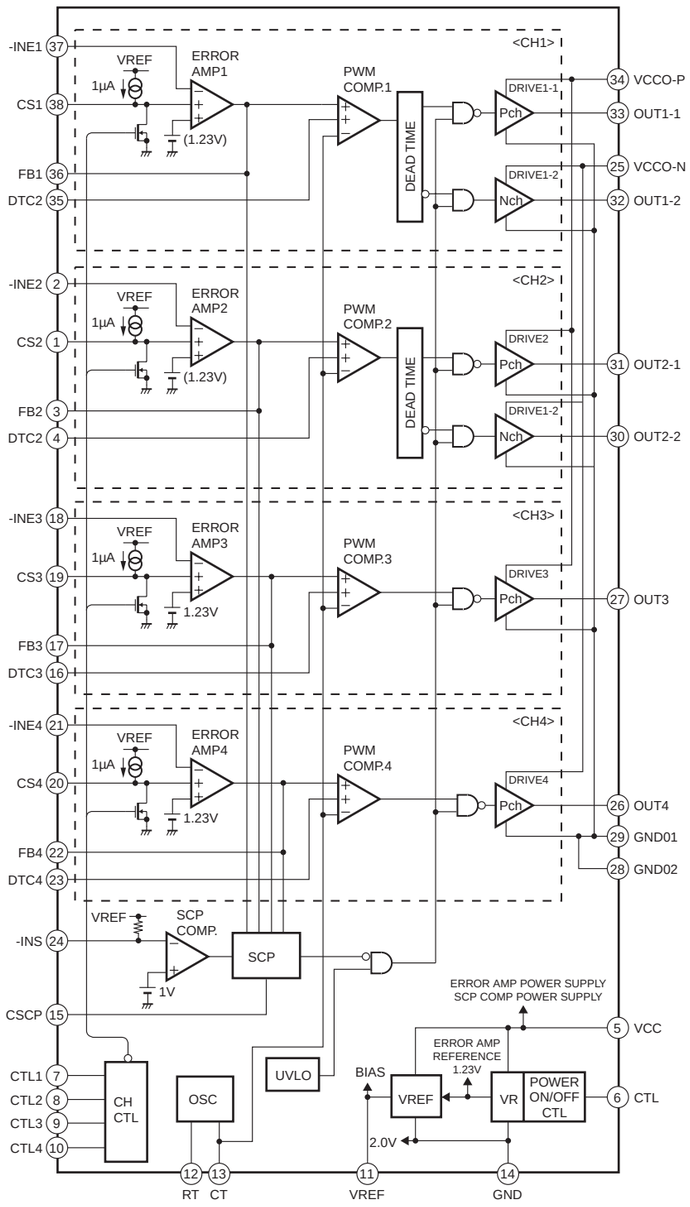
Symbol No.	Location	GX20A	MV780A	MV730A
C1314	4D	100p	100p	Not Provided
C1316	4C	0.068	0.068	560p
C1318	4D	1	1	Not Provided
C1324	4C	0.22	0.22	0.01
C1333	4C	2.2	1	Not Provided
C1334	4C	4.7	4.7	Not Provided
C1360	2E	0.01	0.01	Not Provided
C1361	3F	0.01	0.01	Not Provided
C1363	3F	0.01	0.01	Not Provided
C1364	4F	0.22	0.22	Not Provided
C1365	4E	0.22	0.22	Not Provided
C1366	4E	220p	220p	Not Provided
C1367	3E	0.01	0.01	Not Provided
C1368	5E	0.01	0.01	Not Provided
C1369	6E	0.01	0.01	Not Provided
C1370	3E	330p	330p	Not Provided
C1371	3E	0.01	0.01	Not Provided
C1372	2E	0.01	0.01	Not Provided
C1373	2E	4700p	4700p	Not Provided
IC1305	4E	NJM13403V-TE1	NJM13403V-TE1	Not Provided
IC1306	2E	NJM13404R-TE1	NJM13404R-TE1	Not Provided
IC1307	3F	NJM3414AV-TE1	NJM3414AV-TE1	Not Provided
IC1308	5F	MB88347PFV	MB88347PFV	Not Provided
Q1302	4D	(XW) 2SB1705TL	(XW) 2SB1705TL	Not Provided
Q1305	2E	(CL) 2SC5343E-CL	(CL) 2SC5343E-CL	Not Provided
R1303	4C	180k	180k	100K
R1308	5B	390	330	220
R1310	4B	82k	100K	120K
R1313	4E	Jumper	Jumper	Not Provided
R1318	4C	8.2k	8.2k	10K
R1332	4C	39k	39k	27K
R1336	4B	10k	10k	Not Provided
R1342	4D	Not Provided	Not Provided	Jumper
R1344	4D	Jumper	Jumper	Not Provided
R1348	4C	5.6k	5.6k	Not Provided
R1350	4C	180	180	Jumper
R1364	4C	Not Provided	Not Provided	2.2K
R1365	2E	100k	100k	Not Provided
R1366	2F	12k	12k	Not Provided
R1367	2E	330	330	Not Provided
R1368	2E	4.7k	4.7k	Not Provided
R1369	3E	4.7k	4.7k	Not Provided
R1372	6E	Jumper	Jumper	Not Provided
R1373	6E	Jumper	Jumper	Not Provided
R1374	4E	Jumper	Jumper	Not Provided
R1377	3E	33k	33k	Not Provided
R1378	2E	33k	33k	Not Provided
R1387	3F	33k	33k	Not Provided
R1388	4F	10k	10k	Not Provided
R1389	3E	100k	100k	Not Provided
R1390	4F	8.2k	8.2k	Not Provided
R1391	4F	39k	39k	Not Provided
R1392	4E	15k	15k	Not Provided
R1393	4E	10k	10k	Not Provided
R1394	3D	Not Provided	Not Provided	1k
R1395	3E	330k	330k	Not Provided
R1396	3E	5.6k	5.6k	Not Provided
R1397	4E	330k	330k	Not Provided
R1398	3F	33k	33k	Not Provided
R1399	5E	27k	27k	Not Provided

S-17 IC Block Diagrams-1/2

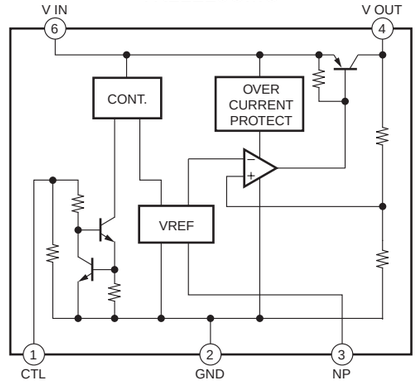
IC0501
MB39A115



IC0502
MB39A110



IC0503,
IC0504
TK11215CMC



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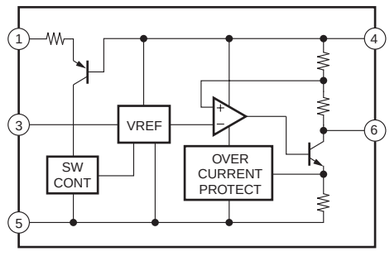
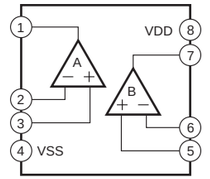


IC1302,
IC1306
NJM13404R-TE1



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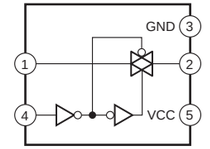
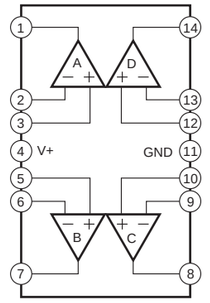


IC1305
NJM13403V-TE1



S-18 IC Block Diagrams-2/2

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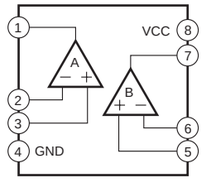
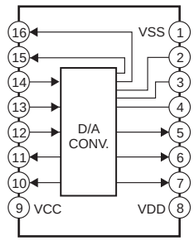
NJM3414AV-TE1



IC1308
MB88347PFV



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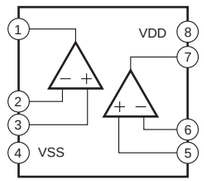
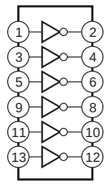
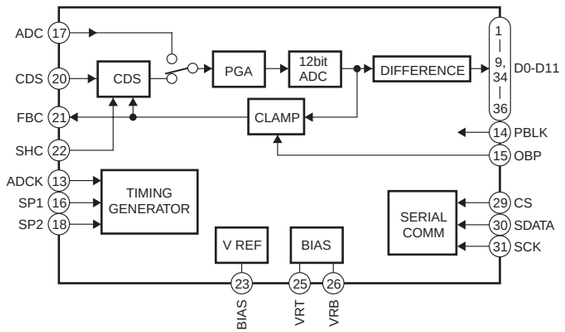
NJU7018VTE1



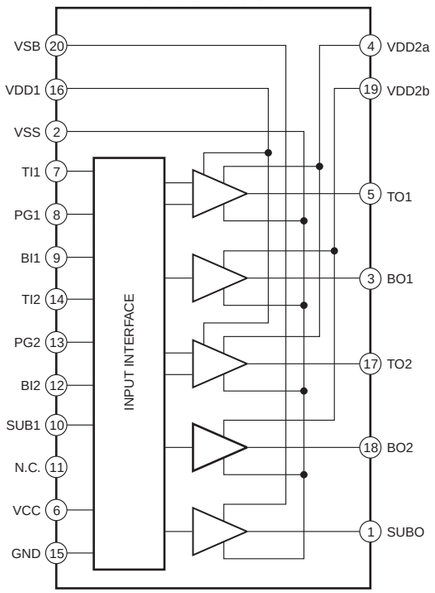
IC2001
SN74ALVC04PWR



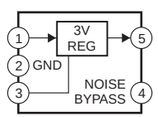
IC2002,
IC2003
HD49343



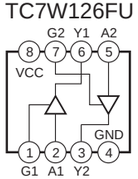
IC2004
UPD16510GR



IC2008
NJM2872AF34-TE12



IC2007
TC7W126FU



IC4007,
IC4008
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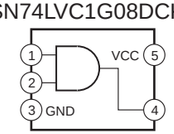

IC4011
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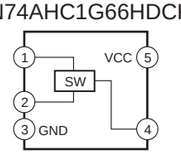

IC8001
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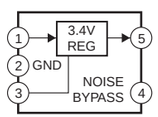

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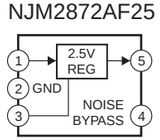
NJM2872AF25



IC4006
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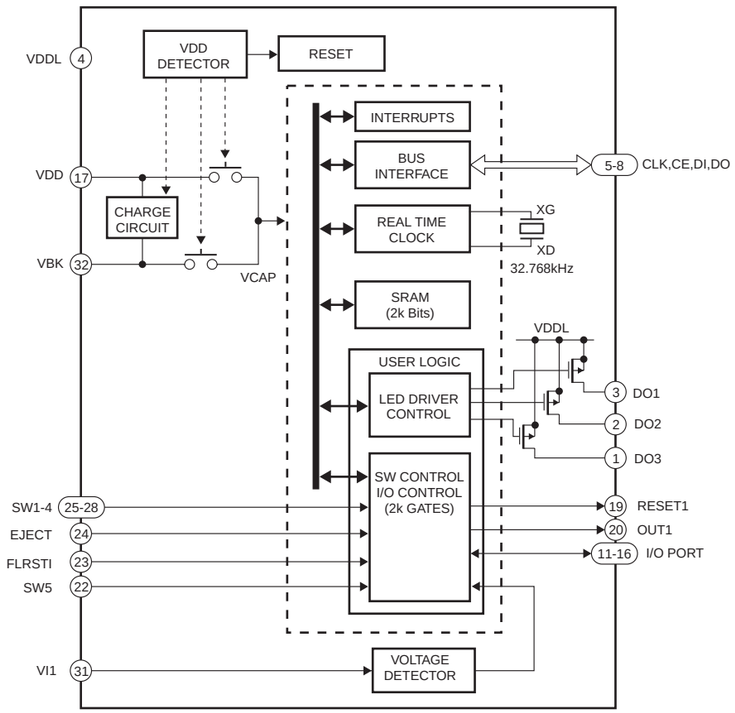
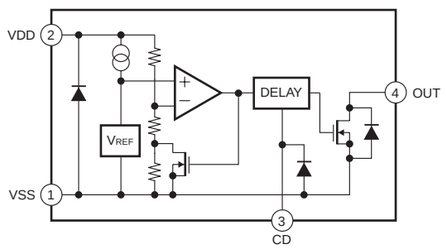
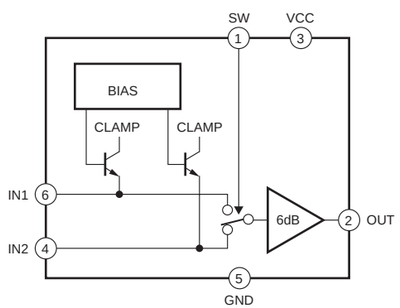


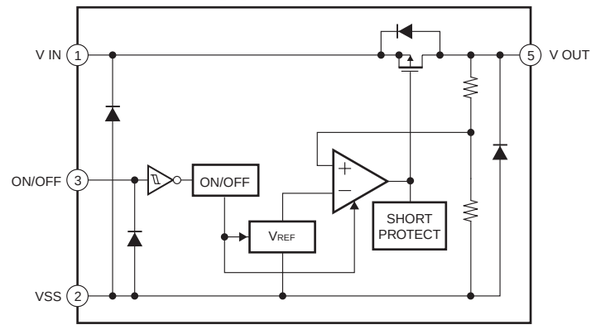
IC4012,
IC4013
S-80952CNNB



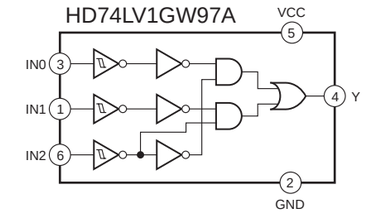
IC6021
MM1503XNRE



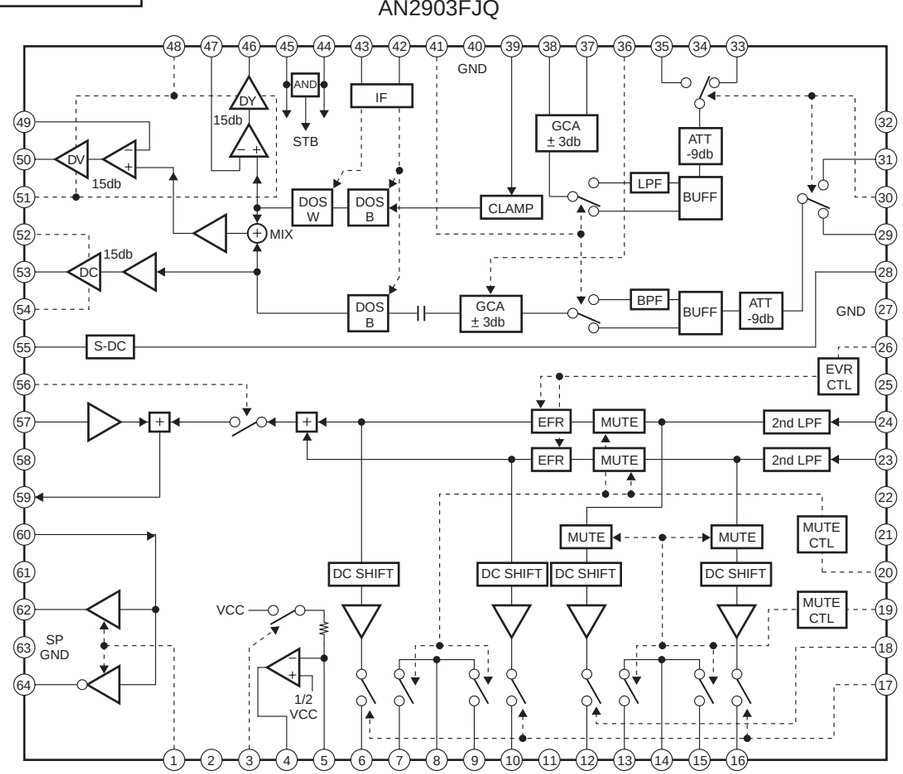
IC4009
S-814A33AMC



IC4010
HD74LV1GW97A



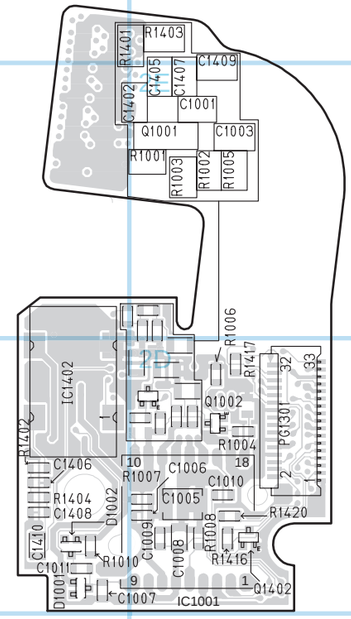
IC6301
AN2903FJQ



C CIRCUIT BOARD DIAGRAMS

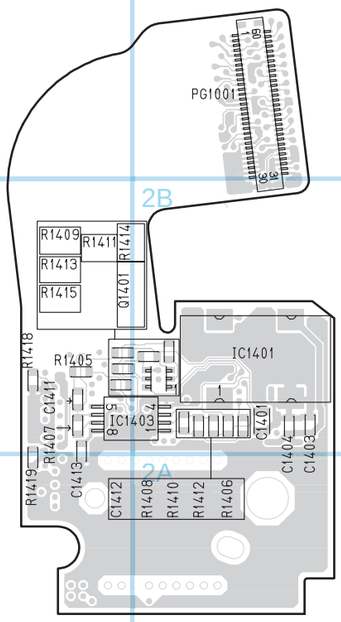
C-1 GSL-H

GSL-H -SIDE A-



[PATTERN No.JD1189-6/7]

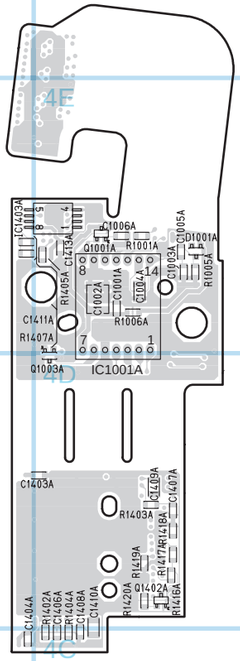
GSL-H -SIDE B-



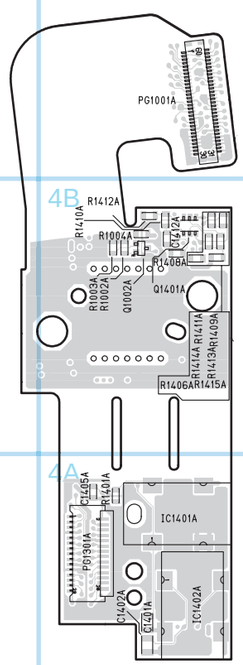
[PATTERN No.JD1189-6/7]

C-2 GSL-M

GSL-M -SIDE A-



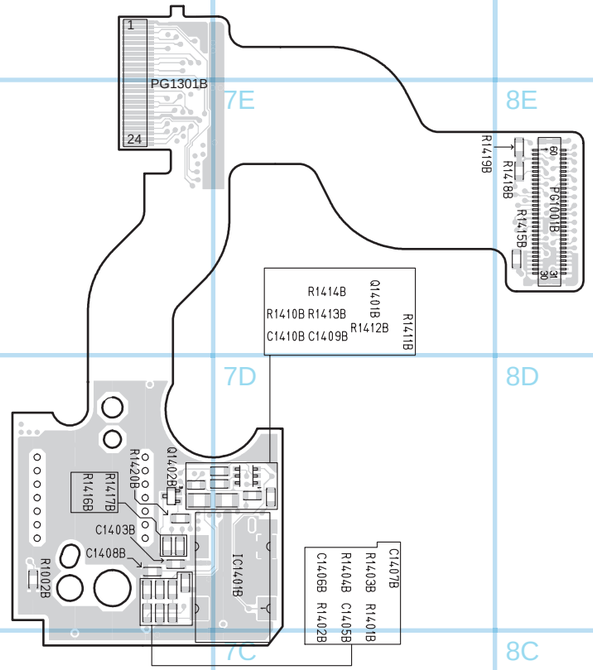
GSL-M -SIDE B-



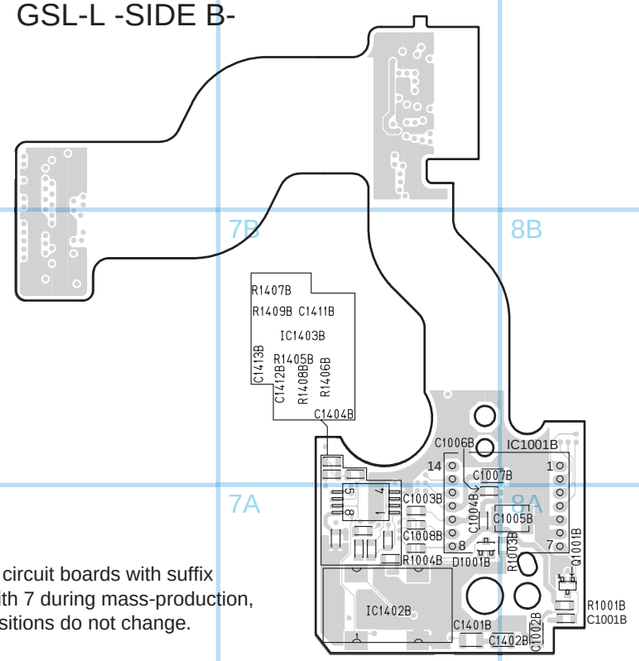
[PATTERN No.JD1195-4]

C-3 GSL-L

GSL-L -SIDE A-



GSL-L -SIDE B-

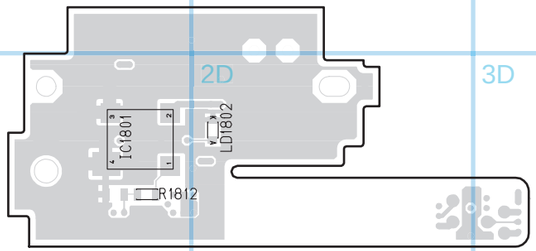


[PATTERN No.JD1196-2]

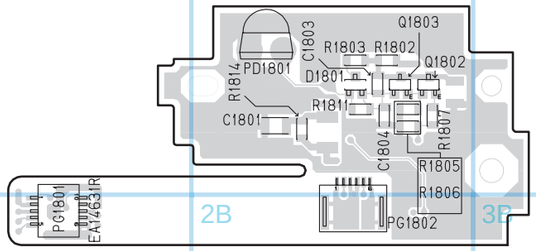
Information:
The AVJ-H, DRF-H, FRT-H and GSL-H circuit boards with suffix number 6 are changed to the boards with 7 during mass-production, but the patterns and parts mounting positions do not change.

C-4 FRT-H/FRT-M/FRT-L

FRT-H
FRT-M
FRT-L -SIDE A-



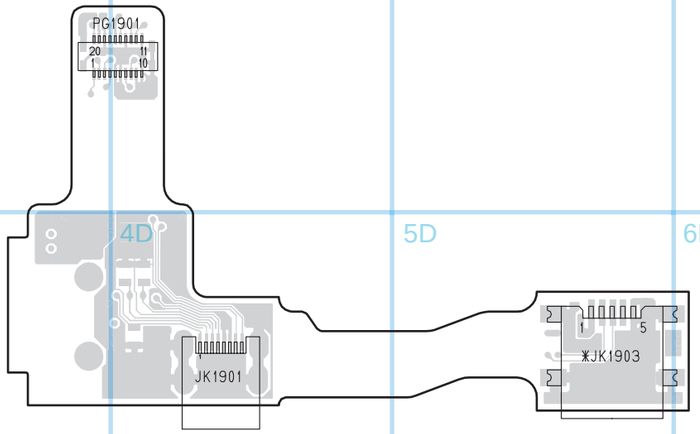
FRT-H
FRT-M
FRT-L -SIDE B-



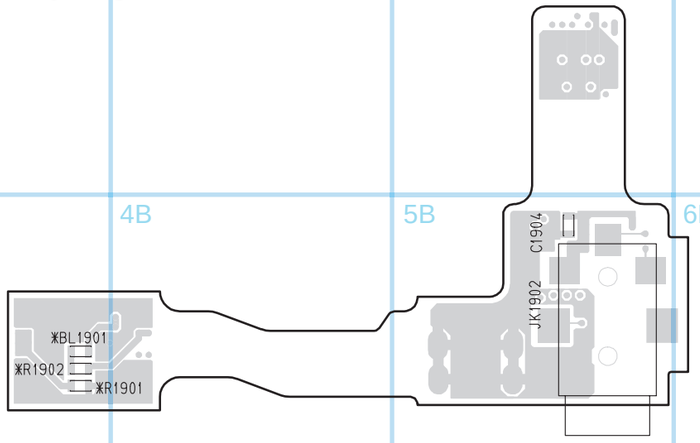
FRT-H [PATTERN No.JD1189-6/7]
FRT-M [PATTERN No.JD1195-4]
FRT-L [PATTERN No.JD1196-5]

C-5 AVJ-H/AVJ-M/AVJ-L

AVJ-H
AVJ-M
AVJ-L -SIDE A-



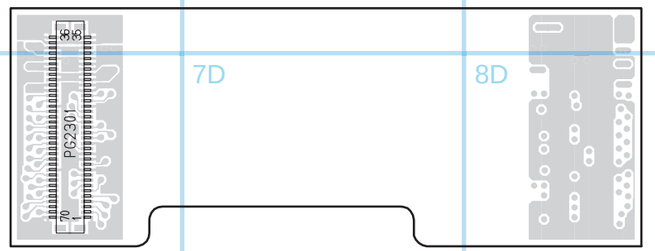
AVJ-H
AVJ-M
AVJ-L -SIDE B-



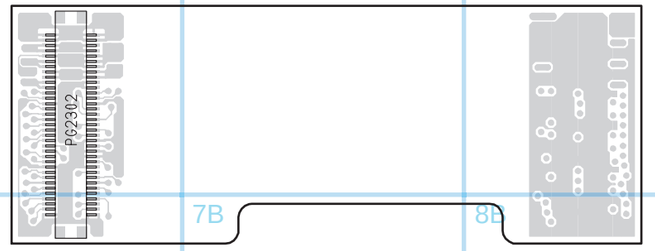
AVJ-H [PATTERN No.JD1189-6/7]
AVJ-M [PATTERN No.JD1195-4]
AVJ-L [PATTERN No.JD1196-5]

C-6 DRF-H/DRF-M/DRF-L

DRF-H
DRF-M
DRF-L -SIDE A-



DRF-H
DRF-M
DRF-L -SIDE B-



DRF-H [PATTERN No.JD1189-6/7]
DRF-M [PATTERN No.JD1195-4]
DRF-L [PATTERN No.JD1196-5]

Information:
The AVJ-H, DRF-H, FRT-H and GSL-H circuit boards with suffix number 6 are changed to the boards with 7 during mass-production, but the patterns and parts mounting positions do not change.

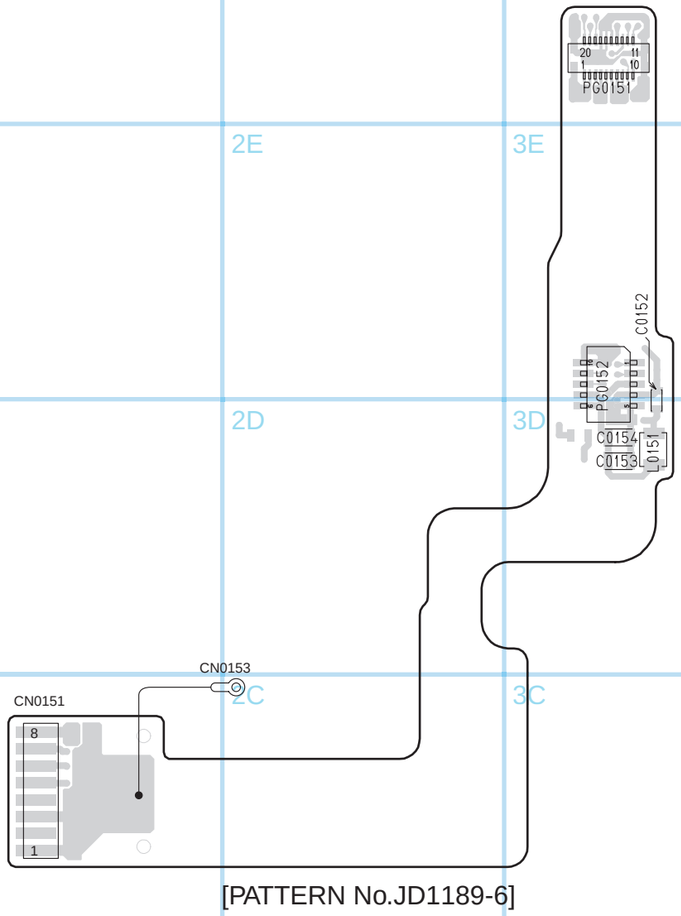
Parts Difference Table

Synbol No.	Location	GX20A/MV780A	MV730A
BL1901	3B	FLC181Z16SMMZ	Not Provided
JK1903	5D	USB JACK	Not Provided
R1901	3B	Jumper	Not Provided
R1902	3B	22k	Not Provided

Note: Components marked * are different between DZ-GX20A, DZ-MV780A and DZ-MV730A: Refer to the "Parts Difference Table" for the different components.

C-7 SHE-H

SHE-H

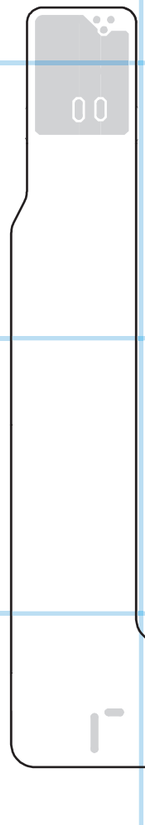


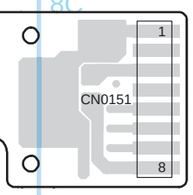
[PATTERN No.JD1189-6]

C-8 SHE-M

SHE-M -SIDE A-

SHE-M -SIDE B-





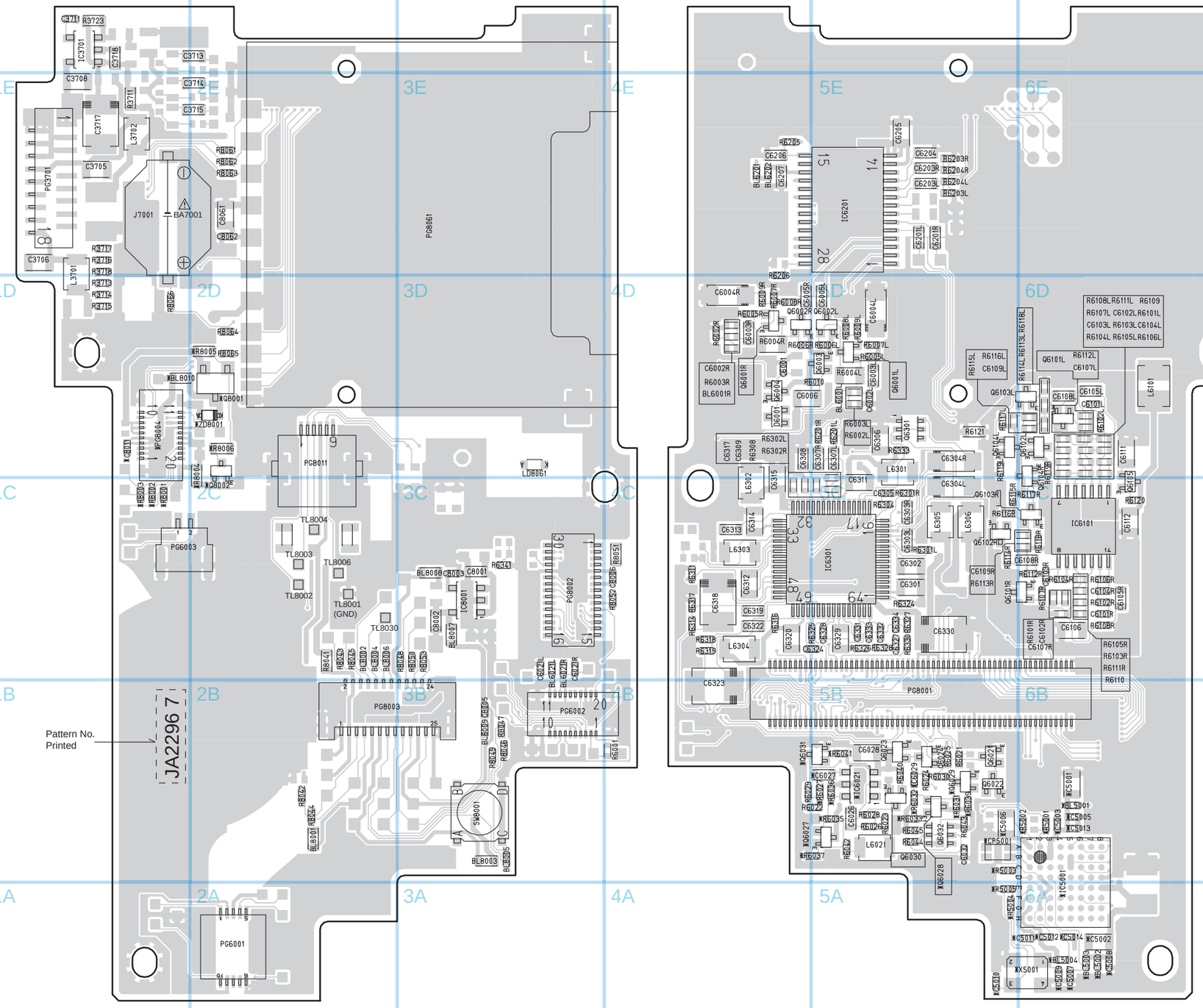
[PATTERN No.JD1195-4]

C-9 AEL [Pattern No.JA2296-7]

Information:
The two types of AEL circuit board are shown, since the circuit board is changed during mass-production.
Check the pattern no. printed on the circuit board when repairing.

AEL -SIDE A-

AEL -SIDE B-



[PATTERN No.JA2296-7]

Note: Components marked ⁎ are different between DZ-GX20A, DZ-MV780A and DZ-MV730A: Refer to the "Parts Difference Table" for the different components.

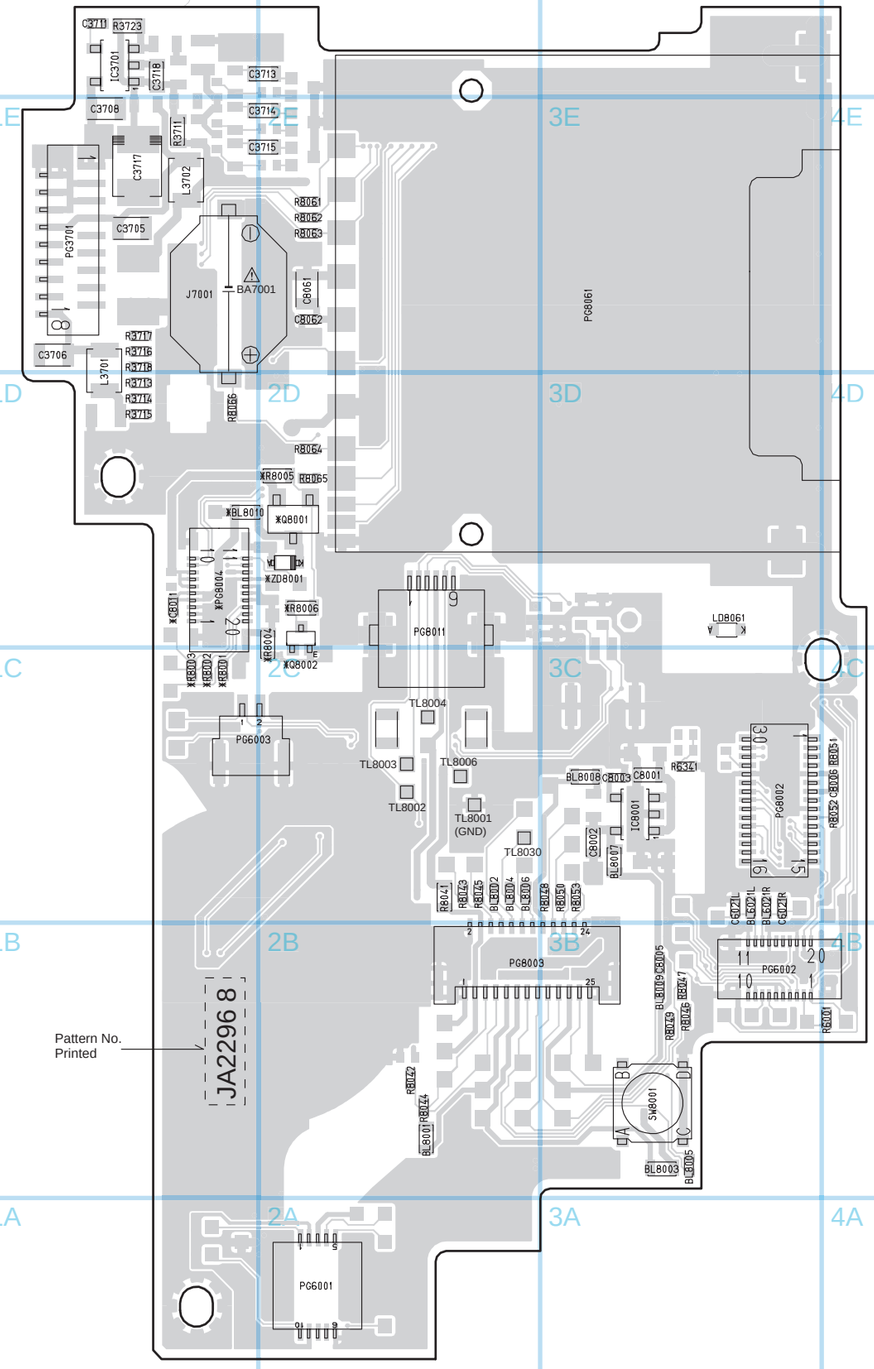
Parts Difference Table

Synbol No.	Location	GX20A/MV780A	MV730A
BL5001	6B	BLM15AG700SN1D	Not Provided
BL5002	6A	BLM15AG700SN1D	Not Provided
BL5003	6A	Jumper	Not Provided
BL5004	6A	BLM15AG700SN1D	Not Provided
BL8010	1D	BLM11B750SAPT	Not Provided
C5001	6B	10	Not Provided
C5002	6A	10	Not Provided
C5003	6B	0.01	Not Provided
C5005	6B	0.01	Not Provided
C5006	5B	4.7	Not Provided
C5007	6A	0.01	Not Provided
C5008	6A	0.01	Not Provided
C5009	6A	15P	Not Provided
C5010	5A	15P	Not Provided
C5011	6A	0.01	Not Provided
C5012	6A	0.01	Not Provided
C5013	6B	0.01	Not Provided
C5014	6A	0.01	Not Provided
C6027	5B	1	Not Provided
C6029	5B	0.1	Not Provided
C8011	1D	1000P	Not Provided
CP5001	5B	BM10631R	Not Provided
IC5001	6A	M66592WG	Not Provided
IC6021	5B	MM1503XNRE-LF	Not Provided
PG8004	1D	20P	Not Provided
Q6027	4B	Not Provided	(CL) 2SC5343E-CL
Q6028	5B	(CL) 2SC5343E-CL	Not Provided
Q6029	5B	(CL) 2SC5343E-CL	Not Provided
Q6031	4B	(CL) 2SC5343E-CL	Not Provided
Q8001	2D	(TX) RTR020P02TL	Not Provided
Q8002	2C	(N5)RT1N144U-T11-1	Not Provided
R5001	6B	Jumper	Not Provided
R5002	6B	Jumper	Not Provided
R5003	5B	5.6k 1%	Not Provided
R5004	5A	1M	Not Provided
R5005	5A	1K	Not Provided
R6027	5B	560	Not Provided
R6031	5B	100k	Not Provided
R6032	5B	100k	Not Provided
R6033	5B	2.2k	Not Provided
R6035	5B	Not Provided	100k
R6036	5B	Not Provided	100k
R6037	4B	Not Provided	1k
R6039	5B	1.5k	Not Provided
R6041	5B	1.5k	Not Provided
R8001	1C	1k	Not Provided
R8002	1C	1k	Not Provided
R8003	1C	1k	Not Provided
R8004	2C	Jumper	Not Provided
R8005	2D	470k	Not Provided
R8006	2D	220k	Not Provided
X5001	6A	24MHz	Not Provided
ZD8001	2D	(35)EDZTE6113B	Not Provided

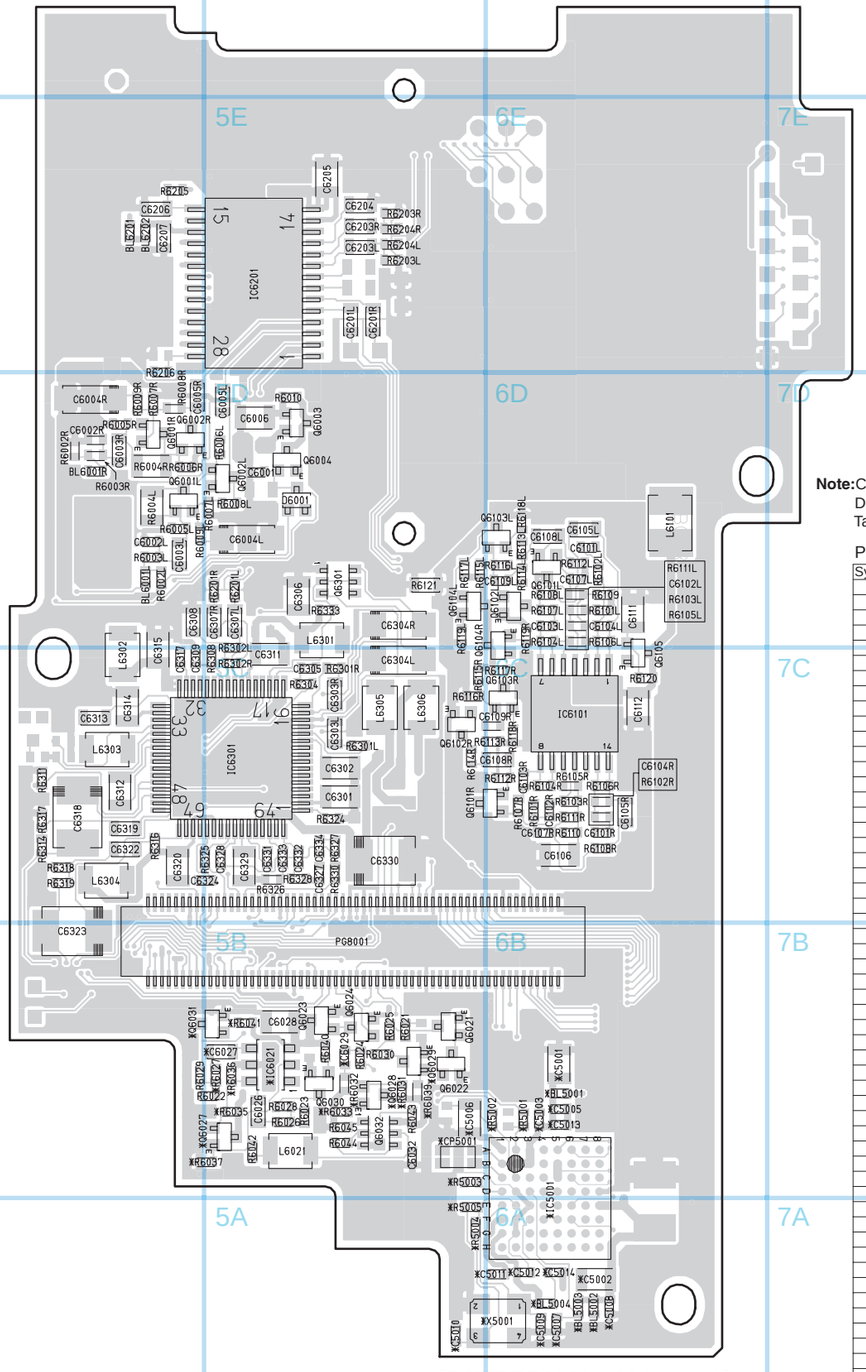
C-10 AEL [Pattern No.JA2296-8]

Information:
The two types of AEL circuit board are shown, since the circuit board is changed during mass-production.
Check the pattern no. printed on the circuit board when repairing.

AEL -SIDE A-



AEL -SIDE B-



[PATTERN No.JA2296-8]

Note: Components marked * are different between DZ-GX20A, DZ-MV780A and DZ-MV730A: Refer to the "Parts Difference Table" for the different components.

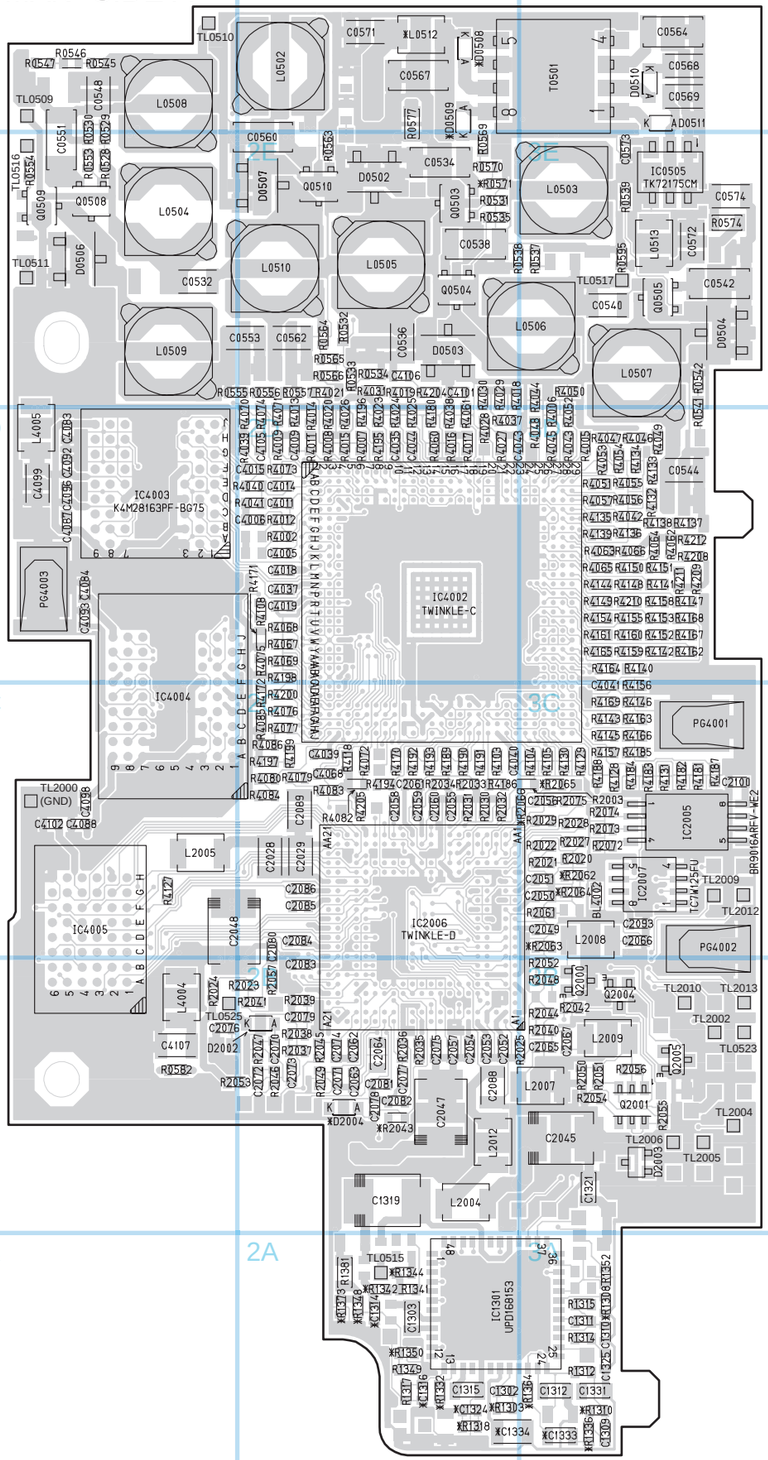
Parts Difference Table

Symbol No.	Location	GX20A/MV780A	MV730A
BL5001	6B	BLM15AG700SN1D	Not Provided
BL5002	6A	BLM15AG700SN1D	Not Provided
BL5003	6A	Jumper	Not Provided
BL5004	6A	BLM15AG700SN1D	Not Provided
BL8010	1D	BLM11B750SAPT	Not Provided
C5001	6B	10	Not Provided
C5002	6A	10	Not Provided
C5003	6B	0.01	Not Provided
C5005	6B	0.01	Not Provided
C5006	5B	4.7	Not Provided
C5007	6A	0.01	Not Provided
C5008	6A	0.01	Not Provided
C5009	6A	15P	Not Provided
C5010	5A	15P	Not Provided
C5011	6A	0.01	Not Provided
C5012	6A	0.01	Not Provided
C5013	6B	0.01	Not Provided
C5014	6A	0.01	Not Provided
C6027	5B	1	Not Provided
C6029	5B	0.1	Not Provided
C8011	1D	1000P	Not Provided
CP5001	5B	BM10631R	Not Provided
IC5001	6A	M66592WG	Not Provided
IC6021	5B	MM1503XNRE-LF	Not Provided
PG8004	1D	20P	Not Provided
Q6027	4B	Not Provided	(CL) 2SC5343E-CL
Q6028	5B	(CL) 2SC5343E-CL	Not Provided
Q6029	5B	(CL) 2SC5343E-CL	Not Provided
Q6031	4B	(CL) 2SC5343E-CL	Not Provided
Q8001	2D	(TX) RTR020P02TL	Not Provided
Q8002	2C	(N5)RT1N144U-T11-1	Not Provided
R5001	6B	Jumper	Not Provided
R5002	6B	Jumper	Not Provided
R5003	5B	5.6k 1%	Not Provided
R5004	5A	1M	Not Provided
R5005	5A	1K	Not Provided
R6027	5B	560	Not Provided
R6031	5B	100k	Not Provided
R6032	5B	100k	Not Provided
R6033	5B	2.2k	Not Provided
R6035	5B	Not Provided	100k
R6036	5B	Not Provided	100k
R6037	4B	Not Provided	1k
R6039	5B	1.5k	Not Provided
R6041	5B	1.5k	Not Provided
R8001	1C	1k	Not Provided
R8002	1C	1k	Not Provided
R8003	1C	1k	Not Provided
R8004	2C	Jumper	Not Provided
R8005	2D	470k	Not Provided
R8006	2D	220k	Not Provided
X5001	6A	24MHz	Not Provided
ZD8001	2D	(35)EDZTE6113B	Not Provided

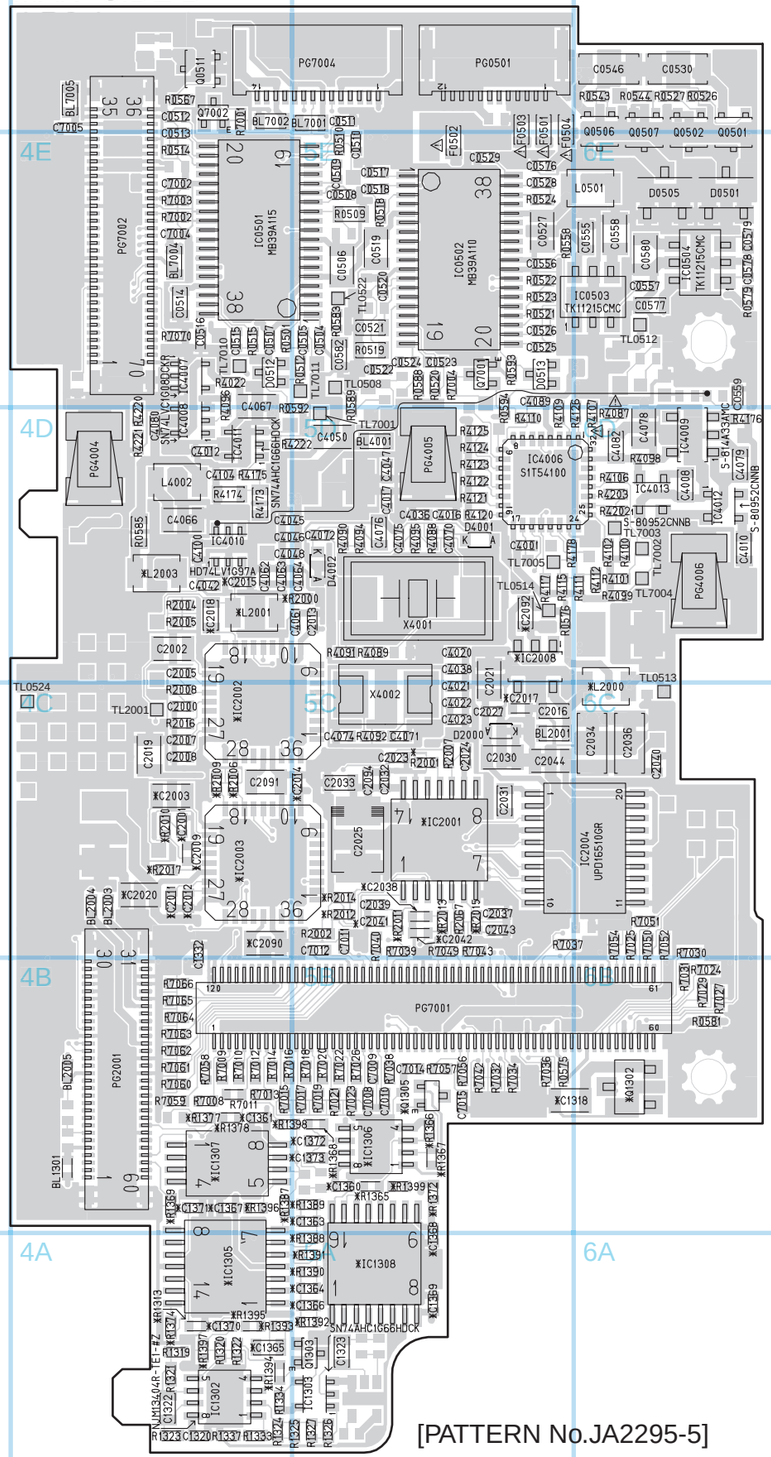
C-11 MAN

Note: Components marked ⋆ are different between DZ-GX20A, DZ-MV780A and DZ-MV730A: Refer to the "Parts Difference Table" for the different components.

MAN -SIDE A-



MAN -SIDE B-



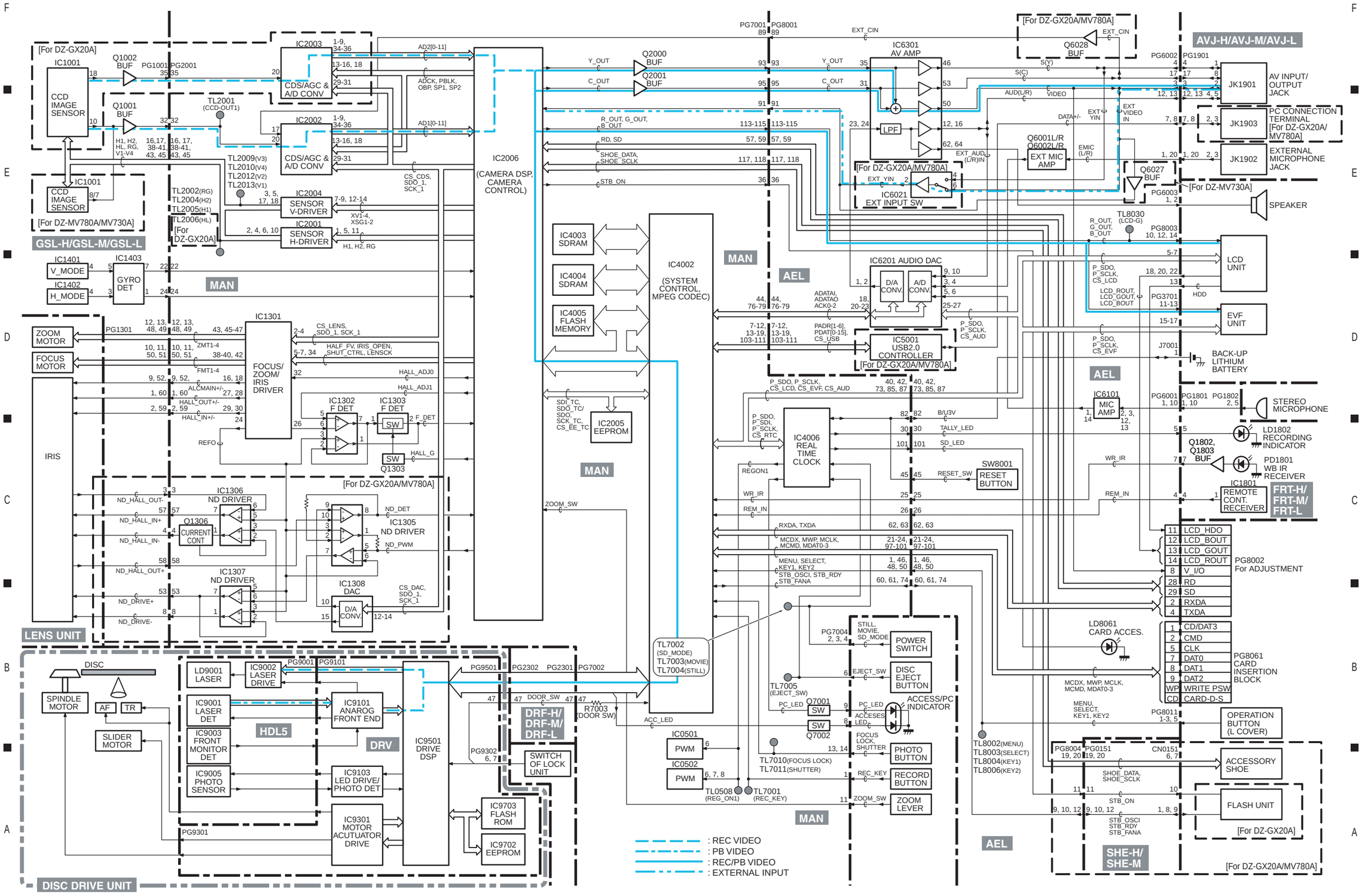
[PATTERN No.JA2295-5]

Parts Difference Table

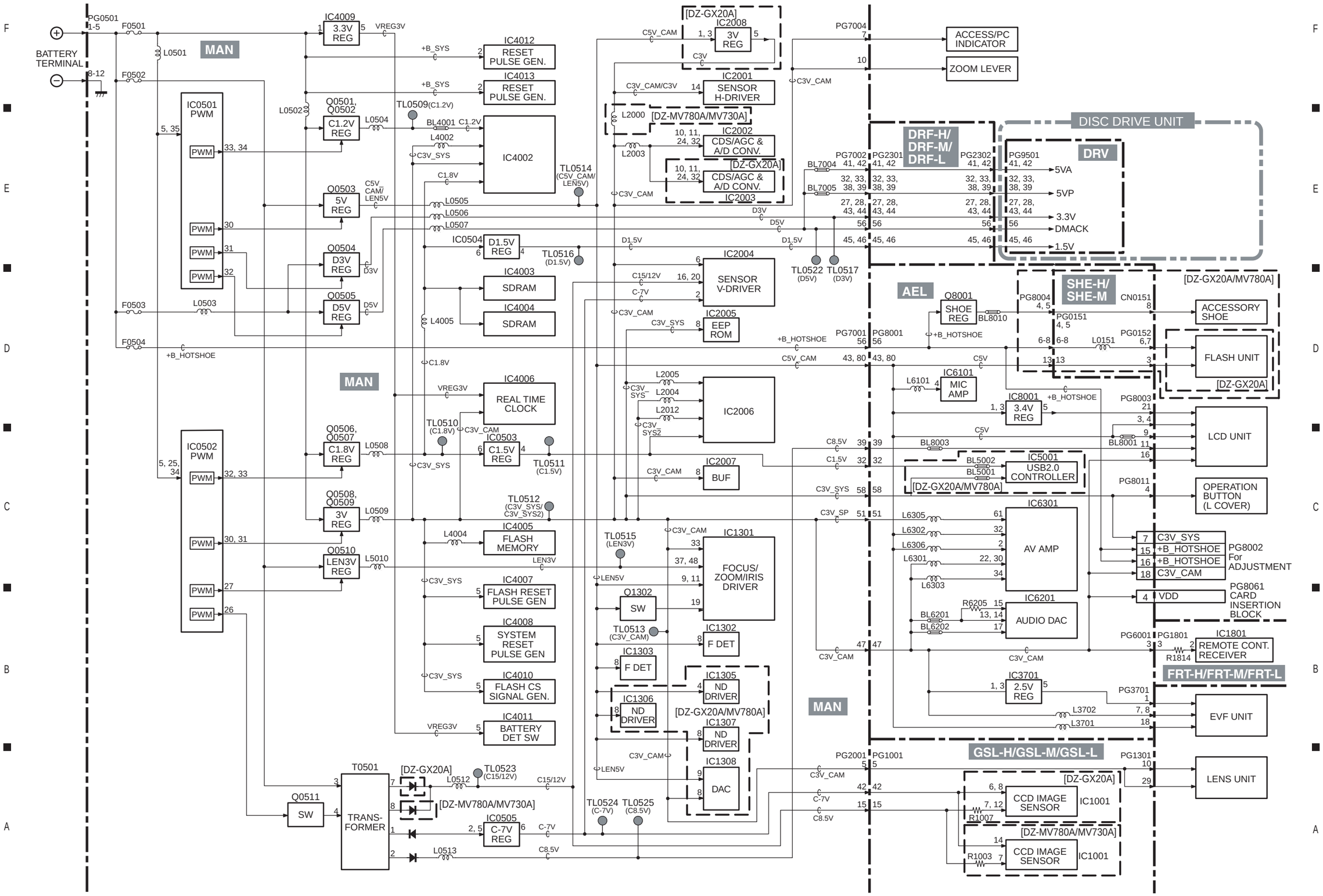
Symbol No.	Location	GX20A	MV780A	MV730A
C1314	2A	100p	100p	Not Provided
C1316	2A	0.068	0.068	560p
C1318	5B	1	1	Not Provided
C1324	2A	0.22	0.22	0.01
C1333	3A	2.2	1	Not Provided
C1334	2A	4.7	4.7	Not Provided
C1360	5B	0.01	0.01	Not Provided
C1361	4B	0.01	0.01	Not Provided
C1363	5B	0

B Block Diagrams

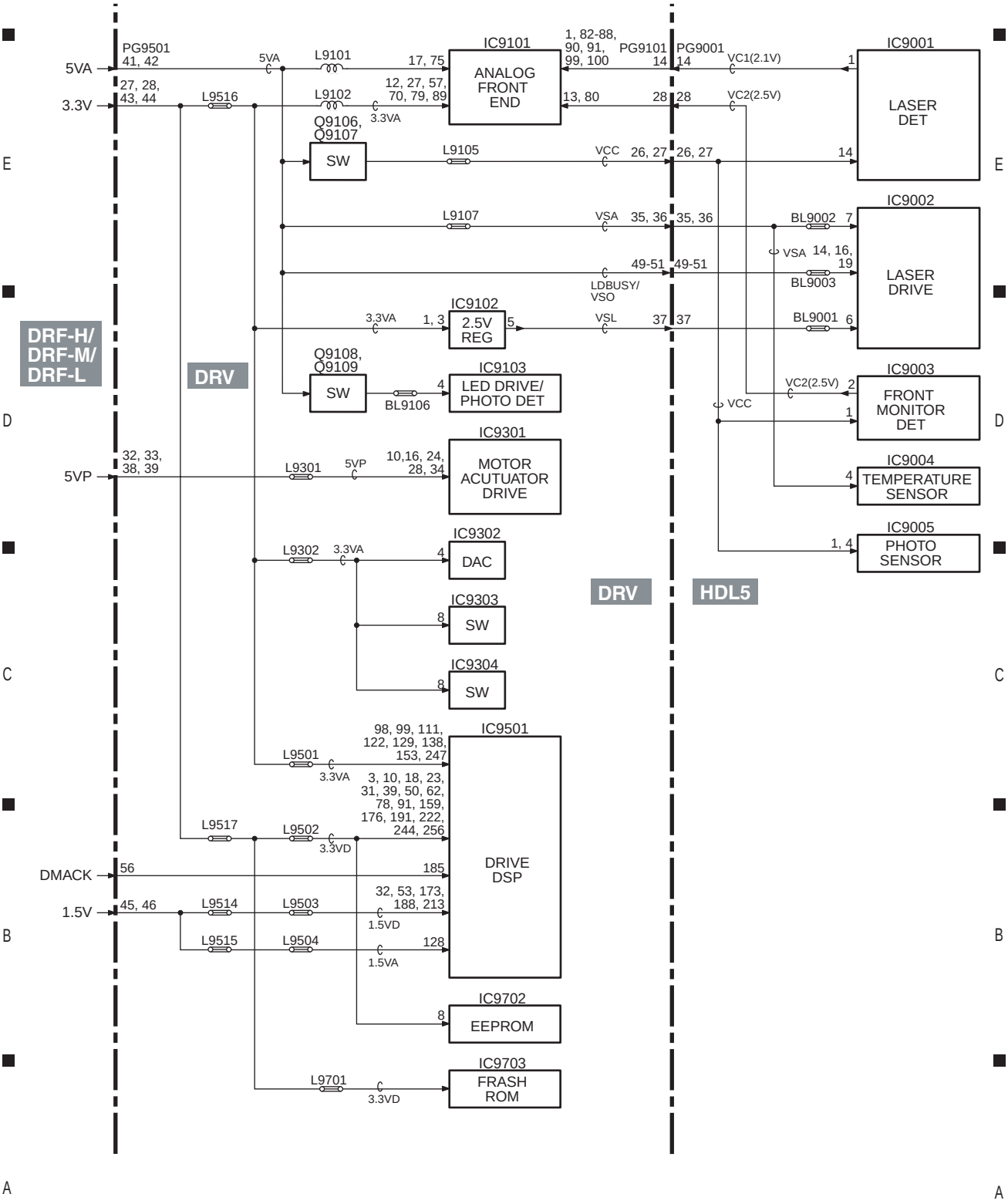
B-1 Video/Audio Signal Process



B-2 Power-1


BATTERY TERMINAL
PG0501
1-5
8-12
F0501
F0502
L0501
MAN
IC0501 PWM
5, 35
PWM
33, 34
30
31
32
IC4009 3.3V REG
VREG3V
IC4012 RESET PULSE GEN.
IC4013 RESET PULSE GEN.
+B_SYS
Q0501, Q0502 C1.2V REG
L0502
L0504
TL0509 (C1.2V)
BL4001 C1.2V
L4002
C3V_SYS
IC4002
C1.8V
Q0503 5V REG
C5V_CAM/LEN5V
L0505
L0506
L0507
IC0504 D1.5V REG
TL0514 (C5V_CAM/LEN5V)
TL0516 (D1.5V)
Q0504 D3V REG
D3V
Q0505 D5V REG
D5V
F0503
L0503
F0504
+B_HOTSHOE
L4005
IC4003 SDRAM
IC4004 SDRAM
C1.8V
MAN
VREG3V
IC4006 REAL TIME CLOCK
TL0510 (C1.8V)
C3V_CAM
IC0502 PWM
5, 25, 34
32, 33
30, 31
27
26
Q0506, Q0507 C1.8V REG
L0508
IC0503 C1.5V REG
TL0511 (C1.5V)
Q0508, Q0509 3V REG
L0509
TL0512 (C3V_SYS/C3V_SYS2)
Q0510 LEN3V REG
L5010
LEN3V
L4004
IC4005 FLASH MEMORY
IC4007 FLASH RESET PULSE GEN
IC4008 SYSTEM RESET PULSE GEN
IC4010 FLASH CS SIGNAL GEN.
IC4011 BATTERY DET SW
[DZ-GX20A]
IC2008 3V REG
1, 3
5
C5V_CAM
C3V
IC2001 SENSOR H-DRIVER
C3V_CAM/C3V
14
L2000
[DZ-MV780A/MV730A]
IC2002 CDS/AGC & A/D CONV.
10, 11, 24, 32
L2003
[DZ-GX20A]
IC2003 CDS/AGC & A/D CONV.
C3V_CAM
D3V
D5V
D1.5V
TL0522 (D5V)
TL0517 (D3V)
IC2004 SENSOR V-DRIVER
6
C15/12V
16, 20
C-7V
2
IC2005 EEP ROM
C3V_SYS
8
L2005
L2004
L2012
C3V_SYS2
IC2006
IC2007 BUF
TL0515 (LEN3V)
IC1301 FOCUS/ZOOM/IRIS DRIVER
33
37, 48
9, 11
19
LEN5V
Q1302 SW
TL0513 (C3V_CAM)
IC1302 F DET
IC1303 F DET
IC1305 ND DRIVER
IC1306 ND DRIVER
[DZ-GX20A/MV780A]
IC1307 ND DRIVER
IC1308 DAC
LEN5V
T0501 TRANS-FORMER
Q0511 SW
[DZ-GX20A]
[DZ-MV780A/MV730A]
TL0523 (C15/12V)
L0512
C15/12V
TL0524 (C-7V)
TL0525 (C8.5V)
IC0505 C-7V REG
L0513
C8.5V
PG7004
7
10
ACCESS/PC INDICATOR
ZOOM LEVER
DISC DRIVE UNIT
DRF-H/DRF-M/DRF-L
DRV
PG7002 41, 42
PG2301 41, 42
PG2302 41, 42
PG9501 41, 42
BL7004
BL7005
32, 33, 38, 39
27, 28, 43, 44
56
45, 46
5VA
5VP
3.3V
DMACK
1.5V
AEL
Q8001 SHOE REG
BL8010
PG8004 4, 5
CN0151 8
SHE-H/SHE-M
[DZ-GX20A/MV780A]
ACCESSORY SHOE
PG0151 4, 5
PG0152 6,7
L0151
6-8
13
FLASH UNIT
[DZ-GX20A]
PG7001 56
PG8001 56
+B_HOTSHOE
C5V_CAM 43, 80
C5V
L6101
IC6101 MIC AMP
IC8001 3.4V REG
PG8003 21
3, 4
9
11
16
LCD UNIT
BL8003
BL8001
C8.5V 39
C1.5V 32
IC5001 USB2.0 CONTROLLER
BL5002
BL5001
[DZ-GX20A/MV780A]
PG8011 4
OPERATION BUTTON (L COVER)
C3V_SYS 58
C3V_SP 51
IC6301 AV AMP
L6305
L6302
L6306
L6301
L6303
61
32
2
22, 30
34
7 C3V_SYS
15 +B_HOTSHOE
16 +B_HOTSHOE
18 C3V_CAM
PG8002 For ADJUSTMENT
4 VDD
PG8061 CARD INSERTION BLOCK
IC6201 AUDIO DAC
R6205 15
13, 14
BL6201
BL6202
17
PG6001 3
PG1801 3
IC1801 REMOTE CONT. RECEIVER
R1814
2
FRT-H/FRT-M/FRT-L
47
IC3701 2.5V REG
PG3701 1
7, 8
18
L3702
L3701
EVF UNIT
GSL-H/GSL-M/GSL-L
PG2001 5
PG1001 5
PG1301 10
29
LENS UNIT
42
C-7V
15
C8.5V
[DZ-GX20A]
6, 8
7, 12
CCD IMAGE SENSOR
IC1001
R1007
[DZ-MV780A/MV730A]
14
R1003
7
CCD IMAGE SENSOR
IC1001

B-3 Power-2


DRF-H/
DRF-M/
DRF-L
DRV
DRV
HDL5
5VA
3.3V
5VP
1.5V
DMACK
PG9501
41, 42
27, 28,
43, 44
32, 33,
38, 39
45, 46
56
L9516
L9101
L9102
L9105
L9107
L9301
L9302
L9501
L9502
L9503
L9504
L9514
L9515
L9517
L9701
3.3VA
5VA
5VP
1.5VD
1.5VA
3.3VD
IC9101
ANALOG
FRONT
END
17, 75
12, 27, 57,
70, 79, 89
1, 82-88,
90, 91,
99, 100
13, 80
Q9106,
Q9107
SW
VCC
26, 27
VSA
35, 36
Q9108,
Q9109
SW
BL9106
IC9102
2.5V
REG
1, 3
5
VSL
37
IC9103
LED DRIVE/
PHOTO DET
4
IC9301
MOTOR
ACUTUATOR
DRIVE
10,16, 24,
28, 34
IC9302
DAC
4
IC9303
SW
8
IC9304
SW
8
IC9501
DRIVE
DSP
98, 99, 111,
122, 129, 138,
153, 247
3, 10, 18, 23,
31, 39, 50, 62,
78, 91, 159,
176, 191, 222,
244, 256
185
32, 53, 173,
188, 213
128
IC9702
EEPROM
8
IC9703
FRASH
ROM
PG9101
14
PG9001
14
28
13, 80
28
VC1(2.1V)
VC2(2.5V)
1
IC9001
LASER
DET
14
26, 27
26, 27
IC9002
LASER
DRIVE
BL9002
7
VSA
14, 16,
19
49-51
49-51
LDBUSY/
VSO
BL9003
BL9001
6
37
IC9003
FRONT
MONITOR
DET
VC2(2.5V)
2
VCC
1
IC9004
TEMPERATURE
SENSOR
4
IC9005
PHOTO
SENSOR
1, 4

Parts List				
Caution	**Symbol No.**	**Part No.**	**Description**	**Note**
⚠	1	JP43151	PWB ASSY AEL	For GX20A
⚠	1	JP43151	PWB ASSY AEL	For MV780A
⚠	1	JP43157	PWB ASSY AEL	For MV730A
	2	JP43231	PWB ASSY SHE-H	For GX20A
	2	JP43601	PWB ASSY SHE-M	For MV780A
	3	JP43811	PWB ASSY FRT-H	For GX20A
	3	JP43781	PWB ASSY FRT-M	For MV780A
	3	JP43791	PWB ASSY FRT-L	For MV730A
	4	JP43251	PWB ASSY GSL-H	For GX20A
	4	JP43621	PWB ASSY GSL-M	For MV780A
	4	JP43661	PWB ASSY GSL-L	For MV730A
	5	JP43261	PWB ASSY DRF-H	For GX20A
	5	JP43631	PWB ASSY DRF-M	For MV780A
	5	JP43671	PWB ASSY DRF-L	For MV730A
	6	JP43801	PWB ASSY AVJ-H	For GX20A
	6	JP43611	PWB ASSY AVJ-M	For MV780A
	6	JP43652	PWB ASSY AVJ-L	For MV730A
⚠	7	JP43144	PWB ASSY MAN	For GX20A
⚠	7	JP43574	PWB ASSY MAN	For MV780A
⚠	7	JP43691	PWB ASSY MAN	For MV730A
⚠	8	UA12611	DVD DRIVE MECHA(PC5A)	For GX20A/MV730A
⚠	8	UA12611	DVD DRIVE MECHA(PC5A)	For MV780A
	101	MC10621	HEAT SINK	For GX20A/MV730A
	101	MC10621	HEAT SINK	For MV780A
	102	MC10624	HEAT SINK	For GX20A/MV730A
	102	MC10624	HEAT SINK	For MV780A
	103	MC10623	HEAT SINK	For GX20A/MV730A
	103	MC10623	HEAT SINK	For MV780A
	104	MN20271	SHEET,LCD	For GX20A/MV730A
	104	MN20271	SHEET,LCD	For MV780A
	105	MK13791	SCREW(M1.7X3)	
	106	DP10371	FLASH,LAMP	For GX20A
	107	HP14173	EVF ASSY	For GX20A/MV730A
	107	HP14173	EVF ASSY	For MV780A
⚠	108	QD40583	CASE,REAR	For GX20A/MV730A
⚠	108	QD40583	CASE,REAR	For MV780A
	113	PC19931	BUTTON,BATTERY	For GX20A/MV730A
	113	PC19931	BUTTON,BATTERY	For MV780A
	114	KL15901	SPRING,BATTERY	For GX20A/MV730A
	114	KL15901	SPRING,BATTERY	For MV780A
	115	PV10441	STRAP,HAND	For GX20A/MV730A
	115	PV10441	STRAP,HAND	For MV780A
	117	NA34971	FRAME,TOP	For GX20A
	117	NA34991	FRAME,TOP	For MV780A
	117	NA35011	FRAME,TOP	For MV730A
	118	QX17911	COVER,TOP	For GX20A/MV780A
	118	QX17931	COVER,TOP	For MV780A
	119	NJ13371	HOLDER,JACK	For GX20A/MV730A
	119	NJ13371	HOLDER,JACK	For MV780A

Parts List				
Caution	**Symbol No.**	**Part No.**	**Description**	**Note**
⚠	120	QD40632	CASE,FRONT	For GX20A
⚠	120	QD40642	CASE,FRONT	For MV780A
⚠	120	QD40654	CASE,FRONT	For MV730A
	121	GH10431	MICROPHONE	For GX20A/MV780A
	121	GH10432	MICROPHONE	For MV780A
⚠	122	QX18181	COVER,LENS	For GX20A
⚠	122	QX17971	COVER,LENS	For MV780A
⚠	122	QX18211	COVER,LENS	For MV730A
	123	QX17641	HOOD	For GX20A
	123	QX17661	HOOD	For MV780A
	123	QX17681	HOOD	For MV730A
	124	QX17631	CUP,EYE	For GX20A/MV730A
	124	QX17631	CUP,EYE	For MV780A
	126	QX17197	COVER,ADJUSTMENT	For GX20A/MV730A
	126	QX17197	COVER,ADJUSTMENT	For MV780A
	128	MC10622	HEAT SINK	For GX20A/MV730A
	128	MC10622	HEAT SINK	For MV780A
	129	NA34741	FRAME,MECHA	For GX20A/MV730A
	129	NA34741	FRAME,MECHA	For MV780A
⚠	130	QD40592	CASE,SIDER	For GX20A
⚠	130	QD41572	CASE,SIDE(R)	For MV780A
⚠	130	QD41582	CASE,SIDER	For MV730A
	131	NX27101	LOCK UNIT	For GX20A/MV730A
	131	NX27101	LOCK UNIT	For MV780A
	137	QD40771	COVER(R)	For GX20A
	137	QD41611	COVER(R)	For MV780A
	137	QD41621	COVER(R)	For MV730A
	141	MN20341	CUSHION,F	For GX20A/MV730A
	141	MN20341	CUSHION,F	For MV780A
	142	MN20351	CUSHION,R	For GX20A/MV730A
	142	MN20351	CUSHION,R	For MV780A
	148	NX27391	FRAME,LENS	For GX20A
	148	NX27011	FRAME,LENS	For MV780A
	148	NX27021	FRAME,LENS	For MV730A
	149	HP14211	LCD UNIT	For GX20A
	149	HP14326	LCD UNIT	For MV780A
	149	HP14322	LCD UNIT	For MV730A
⚠	150	QD40482	CASE,SIDE(L)	For GX20A
⚠	150	QD41192	CASE,SIDE(L)	For MV780A
⚠	150	QD41202	CASE,SIDE(L)	For MV730A
	152	NA34692	PLATE(L)	For GX20A/MV730A
	152	NA34692	PLATE(L)	For MV780A
⚠	154	QD40512	COVER(L)	For GX20A
⚠	154	QD40996	COVER(L)	For MV780A
⚠	154	QD40514	COVER(L)	For MV730A
	162	NX27191	FULUCRUM ASSY	For GX20A
	162	NX27196	FULUCRUM ASSY	For MV780A
	162	NX27193	FULUCRUM ASSY	For MV730A

Parts List				
Caution	**Symbol No.**	**Part No.**	**Description**	**Note**
	163	QD40871	CASE,LCD(B)	For GX20A/MV730A
	163	QD40871	CASE,LCD(B)	For MV780A
	165	QD41321	CASE,LCD(U)	For GX20A
	165	QD40966	CASE,LCD(U)	For MV780A
	165	QD40962	CASE,LCD(U)	For MV730A
	169	NA35431	PLATE(J)	For GX20A/MV730A
	169	NA35431	PLATE(J)	For MV780A
	601	KQ11341	LENS ASSY	For GX20A
	601	KQ11381	LENS ASSY	For MV780A
	601	KQ11371	LENS ASSY	For MV730A
	602	UE17151	SENSOR ASSY	For GX20A
	602	UE17161	SENSOR ASSY	For MV780A
	602	UE17171	SENSOR ASSY	For MV730A
	603	MN20361	SPACER	For GX20A
	603	MN20371	SPACER	For MV780A
	603	MN20381	SPACER	For MV730A
	604	DT10592	CRYSTAL	For GX20A
	604	DT10591	CRYSTAL	For MV730A
	604	DT10591	CRYSTAL	For MV780A
	901	MK14202	SCREW(1.7X2.5)	
	902	MK13782	SCREW(1.7X4)	
	903	MK14206	SCREW(1.7X4)	
	906	MK14205	SCREW(1.7X4)	
	908	MK11911	SCREW(1.7X5)	
	910	MK14291	SCREW(M1.7W)	
	913	7773852	SCREW(2X5)	
	916	MK14203	SCREW(1.7X3)	For MV780A
	918	MK13785	SCREW(1.7X3.5)	
⚠	-	TS19151	ADPTOR,AC(DZ-ACS2)	
⚠	-	EV11004	CORD,ACINLET	
	-	EW12525	CORD,AVS	
	-	EV11011	CORD,DC	
	-	MS10812	SHEET	For GX20A/MV780A
⚠	-	HL11432	REMOTE HAND SET(DZ-RM4W)	For GX20A/MV780A
	-	EW12531	CORD,USB	For GX20A/MV780A
	-	TS16756	STRAP,SHOLDER	
	-	QX17713	CAP,LENS	For GX20A/MV730A
	-	QX17753	CAP,LENS	For MV780A
	-	DN11691	CD-ROM(PC)	For GX20A/MV780A
	BL1301	BM10697R	CORE	
	BL1901	BE10134R	COIL 180UH	
	BL2001	BM00139R	FILTER	
	BL4001	BM00131R	FILTER	
	BL4002	BM10697R	CORE	
	BL5001	BM10682R	COIL	For No. JA2296-7
	BL5001	BM10682R	COIL	For No. JA2296-8
	BL5002	BM10682R	COIL	For No. JA2296-7
	BL5002	BM10682R	COIL	For No. JA2296-8

Parts List				
Caution	**Symbol No.**	**Part No.**	**Description**	**Note**
	BL5004	BM10682R	COIL	For No. JA2296-7
	BL5004	BM10682R	COIL	For No. JA2296-8
	BL6001L	BM10697R	CORE	For No. JA2296-7
	BL6001L	BM10697R	CORE	For No. JA2296-8
	BL6001R	BM10697R	CORE	For No. JA2296-7
	BL6001R	BM10697R	CORE	For No. JA2296-8
	BL6201	BM10682R	COIL	For No. JA2296-7
	BL6201	BM10682R	COIL	For No. JA2296-8
	BL6202	BM10682R	COIL	For No. JA2296-7
	BL6202	BM10682R	COIL	For No. JA2296-8
	BL7001	BM00131R	FILTER	
	BL7002	BM00131R	FILTER	
	BL7004	BM00131R	FILTER	
	BL7005	BM00131R	FILTER	
	BL8001	BM10349R	COIL	For No. JA2296-7
	BL8001	BM10349R	COIL	For No. JA2296-8
	BL8002	BM10696R	COIL	For No. JA2296-7
	BL8002	BM10696R	COIL	For No. JA2296-8
	BL8003	BM10349R	COIL	For No. JA2296-7
	BL8003	BM10349R	COIL	For No. JA2296-8
	BL8004	BM10696R	COIL	For No. JA2296-7
	BL8004	BM10696R	COIL	For No. JA2296-8
	BL8005	BM10696R	COIL	For No. JA2296-7
	BL8005	BM10696R	COIL	For No. JA2296-8
	BL8006	BM10696R	COIL	For No. JA2296-7
	BL8006	BM10696R	COIL	For No. JA2296-8
	BL8007	BM10349R	COIL	For No. JA2296-7
	BL8007	BM10349R	COIL	For No. JA2296-8
	BL8008	BM10349R	COIL	For No. JA2296-7
	BL8008	BM10349R	COIL	For No. JA2296-8
	BL8009	BM10696R	COIL	For No. JA2296-7
	BL8009	BM10696R	COIL	For No. JA2296-8
	BL8010	BM10345R	COIL	For No. JA2296-7
	BL8010	BM10345R	COIL	For No. JA2296-8
	C0152	AA01123R	CHIP CAPACITOR 1.0UF+-10% 10V	
	C0153	AA00937R	CHIP CAPACITOR 10UF	
	C0154	AA00937R	CHIP CAPACITOR 10UF	
	C1001	AA00955R	CHIP CAPACITOR 4.7UF 16V	
	C1001A	893222	CERAMIC CHIP 0.01UF+-10% 50V	
	C1002A	AA00422R	CERAMIC CHIP 10UF 16V	
	C1002B	893062	CERAMIC CHIP 1UF+80-20% 16V	
	C1003	AA00955R	CHIP CAPACITOR 4.7UF 16V	
	C1003A	893213	CERAMIC CHIP 2200PF+-10% 50V	
	C1003B	AA01141R	CHIP CAPACITOR 0.1UF+-10% 16V	
	C1004A	AA00937R	CHIP CAPACITOR 10UF 16V	
	C1004B	893239	CERAMIC CHIP 0.01UF+80-20% 50V	
	C1005	AA00422R	CERAMIC CHIP 10UF 16V	
	C1005A	AA01141R	CHIP CAPACITOR 0.1UF+-10% 16V	
	C1005B	AA00422R	CERAMIC CHIP 10UF 16V	

Parts List				
Caution	**Symbol No.**	**Part No.**	**Description**	**Note**
	C1006	893222	CERAMIC CHIP 0.01UF+-10% 50V	
	C1006A	AA01141R	CHIP CAPACITOR 0.1UF+-10% 16V	
	C1006B	893213	CERAMIC CHIP 2200PF+-10% 50V	
	C1007	893208	CERAMIC CHIP 1000PF+-10% 50V	
	C1007B	AA00937R	CHIP CAPACITOR 10UF 16V	
	C1008	AA00937R	CHIP CAPACITOR 10UF 16V	
	C1008B	AA01141R	CHIP CAPACITOR 0.1UF+-10% 16V	
	C1009	893222	CERAMIC CHIP 0.01UF+-10% 50V	
	C1010	AA01141R	CHIP CAPACITOR 0.1UF+-10% 16V	
	C1011	AA01141R	CHIP CAPACITOR 0.1UF+-10% 16V	
	C1401	AA00966R	CHIP CAPACITOR 4.7UF+-20% 6.3V	
	C1401A	AA00966R	CHIP CAPACITOR 4.7UF+-20% 6.3V	
	C1401B	AA00966R	CHIP CAPACITOR 4.7UF+-20% 6.3V	
	C1402	AA00966R	CHIP CAPACITOR 4.7UF+-20% 6.3V	
	C1402A	AA00966R	CHIP CAPACITOR 4.7UF+-20% 6.3V	
	C1402B	AA00966R	CHIP CAPACITOR 4.7UF+-20% 6.3V	
	C1403	893225	CERAMIC CHIP 0.1UF+80-20% 16V	
	C1403A	893225	CERAMIC CHIP 0.1UF+80-20% 16V	
	C1403B	893225	CERAMIC CHIP 0.1UF+80-20% 16V	
	C1404	893225	CERAMIC CHIP 0.1UF+80-20% 16V	
	C1404A	893225	CERAMIC CHIP 0.1UF+80-20% 16V	
	C1404B	893225	CERAMIC CHIP 0.1UF+80-20% 16V	
	C1405	893182	CERAMIC CHIP 0.015UF+-10% 16V	
	C1405A	893182	CERAMIC CHIP 0.015UF+-10% 16V	
	C1405B	893182	CERAMIC CHIP 0.015UF+-10% 16V	
	C1406	893182	CERAMIC CHIP 0.015UF+-10% 16V	
	C1406A	893182	CERAMIC CHIP 0.015UF+-10% 16V	
	C1406B	893182	CERAMIC CHIP 0.015UF+-10% 16V	
	C1407	893182	CERAMIC CHIP 0.015UF+-10% 16V	
	C1407A	893182	CERAMIC CHIP 0.015UF+-10% 16V	
	C1407B	893182	CERAMIC CHIP 0.015UF+-10% 16V	
	C1408	893182	CERAMIC CHIP 0.015UF+-10% 16V	
	C1408A	893182	CERAMIC CHIP 0.015UF+-10% 16V	
	C1408B	893182	CERAMIC CHIP 0.015UF+-10% 16V	
	C1409	AA00966R	CHIP CAPACITOR 4.7UF+-20% 6.3V	
	C1409A	AA00966R	CHIP CAPACITOR 4.7UF+-20% 6.3V	
	C1409B	AA00966R	CHIP CAPACITOR 4.7UF+-20% 6.3V	
	C1410	AA00966R	CHIP CAPACITOR 4.7UF+-20% 6.3V	
	C1410A	AA00966R	CHIP CAPACITOR 4.7UF+-20% 6.3V	
	C1410B	AA00966R	CHIP CAPACITOR 4.7UF+-20% 6.3V	
	C1411	893213	CERAMIC CHIP 2200PF+-10% 50V	
	C1411A	893213	CERAMIC CHIP 2200PF+-10% 50V	
	C1411B	893213	CERAMIC CHIP 2200PF+-10% 50V	
	C1412	893213	CERAMIC CHIP 2200PF+-10% 50V	
	C1412A	893213	CERAMIC CHIP 2200PF+-10% 50V	
	C1412B	893213	CERAMIC CHIP 2200PF+-10% 50V	
	C1413	AA01101R	CERAMIC CAPACITOR 1UF 10V	
	C1413A	AA01101R	CERAMIC CAPACITOR 1UF 10V	
	C1413B	AA01101R	CERAMIC CAPACITOR 1UF 10V	

Parts List				
Caution	**Symbol No.**	**Part No.**	**Description**	**Note**
	C1801	AA00968R	CERAMIC CAPACITOR 10UF+-20% 6.3V	
	C1803	AA01126R	CERAMIC CAPACITOR 0.22UF+-10% 10V	
	C1804	AA01126R	CERAMIC CAPACITOR 0.22UF+-10% 10V	
	C3705	AA00968R	CERAMIC CAPACITOR 10UF+-20% 6.3V	For No. JA2296-7
	C3705	AA00968R	CERAMIC CAPACITOR 10UF+-20% 6.3V	For No. JA2296-8
	C3706	AA00968R	CERAMIC CAPACITOR 10UF+-20% 6.3V	For No. JA2296-7
	C3706	AA00968R	CERAMIC CAPACITOR 10UF+-20% 6.3V	For No. JA2296-8
	C3708	AA00968R	CERAMIC CAPACITOR 10UF+-20% 6.3V	For No. JA2296-7
	C3708	AA00968R	CERAMIC CAPACITOR 10UF+-20% 6.3V	For No. JA2296-8
	C3711	AA10872R	CHIP CAPACITOR 0.1UF+-10% 10V	For No. JA2296-7
	C3711	AA10872R	CHIP CAPACITOR 0.1UF+-10% 10V	For No. JA2296-8
	C3713	AA01111R	CERAMIC CHIP 1UF 6.3V	For No. JA2296-7
	C3713	AA01111R	CERAMIC CHIP 1UF 6.3V	For No. JA2296-8
	C3714	AA01111R	CERAMIC CHIP 1UF 6.3V	For No. JA2296-7
	C3714	AA01111R	CERAMIC CHIP 1UF 6.3V	For No. JA2296-8
	C3715	AA01111R	CERAMIC CHIP 1UF 6.3V	For No. JA2296-7
	C3715	AA01111R	CERAMIC CHIP 1UF 6.3V	For No. JA2296-8
	C3717	AD10891R	CHIP CAPACITOR 100UF+-20% 6.3V	For No. JA2296-7
	C3717	AD10891R	CHIP CAPACITOR 100UF+-20% 6.3V	For No. JA2296-8
	C3718	AA01144R	CHIP CAPACITOR 1.0UF 50V	For No. JA2296-7
	C3718	AA01144R	CHIP CAPACITOR 1.0UF 50V	For No. JA2296-8
	C5001	AA00968R	CERAMIC CAPACITOR 10UF+-20% 6.3V	For No. JA2296-7
	C5001	AA00968R	CERAMIC CAPACITOR 10UF+-20% 6.3V	For No. JA2296-8
	C5002	AA00968R	CERAMIC CAPACITOR 10UF+-20% 6.3V	For No. JA2296-7
	C5002	AA00968R	CERAMIC CAPACITOR 10UF+-20% 6.3V	For No. JA2296-8
	C5003	893333	CERAMIC CHIP 0.01UF+-10% 16V	For No. JA2296-7
	C5003	893333	CERAMIC CHIP 0.01UF+-10% 16V	For No. JA2296-8
	C5005	893333	CERAMIC CHIP 0.01UF+-10% 16V	For No. JA2296-7
	C5005	893333	CERAMIC CHIP 0.01UF+-10% 16V	For No. JA2296-8
	C5006	AA00966R	CHIP CAPACITOR 4.7UF+-20% 6.3V	For No. JA2296-7
	C5006	AA00966R	CHIP CAPACITOR 4.7UF+-20% 6.3V	For No. JA2296-8
	C5007	893333	CERAMIC CHIP 0.01UF+-10% 16V	For No. JA2296-7
	C5007	893333	CERAMIC CHIP 0.01UF+-10% 16V	For No. JA2296-8
	C5008	893333	CERAMIC CHIP 0.01UF+-10% 16V	For No. JA2296-7
	C5008	893333	CERAMIC CHIP 0.01UF+-10% 16V	For No. JA2296-8
	C5009	893265	CERAMIC CHIP 15PF+-5% 50V	For No. JA2296-7
	C5009	893265	CERAMIC CHIP 15PF+-5% 50V	For No. JA2296-8
	C5010	893265	CERAMIC CHIP 15PF+-5% 50V	For No. JA2296-7
	C5010	893265	CERAMIC CHIP 15PF+-5% 50V	For No. JA2296-8
	C5011	893333	CERAMIC CHIP 0.01UF+-10% 16V	For No. JA2296-7
	C5011	893333	CERAMIC CHIP 0.01UF+-10% 16V	For No. JA2296-8
	C5012	893333	CERAMIC CHIP 0.01UF+-10% 16V	For No. JA2296-7
	C5012	893333	CERAMIC CHIP 0.01UF+-10% 16V	For No. JA2296-8
	C5013	893333	CERAMIC CHIP 0.01UF+-10% 16V	For No. JA2296-7
	C5013	893333	CERAMIC CHIP 0.01UF+-10% 16V	For No. JA2296-8
	C5014	893333	CERAMIC CHIP 0.01UF+-10% 16V	For No. JA2296-7
	C5014	893333	CERAMIC CHIP 0.01UF+-10% 16V	For No. JA2296-8
	C6001	893333	CERAMIC CHIP 0.01UF+-10% 16V	For No. JA2296-7
	C6001	893333	CERAMIC CHIP 0.01UF+-10% 16V	For No. JA2296-8

Parts List				
Caution	**Symbol No.**	**Part No.**	**Description**	**Note**
	C6002L	893324	CERAMIC CHIP 2200PF+-10% 50V	For No. JA2296-7
	C6002L	893324	CERAMIC CHIP 2200PF+-10% 50V	For No. JA2296-8
	C6002R	893324	CERAMIC CHIP 2200PF+-10% 50V	For No. JA2296-7
	C6002R	893324	CERAMIC CHIP 2200PF+-10% 50V	For No. JA2296-8
	C6003L	AA01111R	CERAMIC CHIP 1UF 6.3V	For No. JA2296-7
	C6003L	AA01111R	CERAMIC CHIP 1UF 6.3V	For No. JA2296-8
	C6003R	AA01111R	CERAMIC CHIP 1UF 6.3V	For No. JA2296-7
	C6003R	AA01111R	CERAMIC CHIP 1UF 6.3V	For No. JA2296-8
	C6004L	AD10991R	CHIP CAPACITOR 22UF 4V	For No. JA2296-7
	C6004L	AD10991R	CHIP CAPACITOR 22UF 4V	For No. JA2296-8
	C6004R	AD10991R	CHIP CAPACITOR 22UF 4V	For No. JA2296-7
	C6004R	AD10991R	CHIP CAPACITOR 22UF 4V	For No. JA2296-8
	C6005L	AA01111R	CERAMIC CHIP 1UF 6.3V	For No. JA2296-7
	C6005L	AA01111R	CERAMIC CHIP 1UF 6.3V	For No. JA2296-8
	C6005R	AA01111R	CERAMIC CHIP 1UF 6.3V	For No. JA2296-7
	C6005R	AA01111R	CERAMIC CHIP 1UF 6.3V	For No. JA2296-8
	C6006	AA00968R	CERAMIC CAPACITOR 10UF+-20% 6.3V	For No. JA2296-7
	C6006	AA00968R	CERAMIC CAPACITOR 10UF+-20% 6.3V	For No. JA2296-8
	C6021L	893328	CHIP CAPACITOR 4700PF+-10% 25V	For No. JA2296-7
	C6021L	893328	CHIP CAPACITOR 4700PF+-10% 25V	For No. JA2296-8
	C6021R	893328	CHIP CAPACITOR 4700PF+-10% 25V	For No. JA2296-7
	C6021R	893328	CHIP CAPACITOR 4700PF+-10% 25V	For No. JA2296-8
	C6026	AA01111R	CERAMIC CHIP 1UF 6.3V	For No. JA2296-7
	C6026	AA01111R	CERAMIC CHIP 1UF 6.3V	For No. JA2296-8
	C6027	AA01111R	CERAMIC CHIP 1UF 6.3V	For No. JA2296-7
	C6027	AA01111R	CERAMIC CHIP 1UF 6.3V	For No. JA2296-8
	C6028	AA00968R	CERAMIC CAPACITOR 10UF+-20% 6.3V	For No. JA2296-7
	C6028	AA00968R	CERAMIC CAPACITOR 10UF+-20% 6.3V	For No. JA2296-8
	C6029	AA10872R	CHIP CAPACITOR 0.1UF+-10% 10V	For No. JA2296-7
	C6029	AA10872R	CHIP CAPACITOR 0.1UF+-10% 10V	For No. JA2296-8
	C6032	893268	CERAMIC CHIP 27PF+-5% 50V	For No. JA2296-7
	C6032	893268	CERAMIC CHIP 27PF+-5% 50V	For No. JA2296-8
	C6101L	AA10872R	CHIP CAPACITOR 0.1UF+-10% 10V	For No. JA2296-7
	C6101L	AA10872R	CHIP CAPACITOR 0.1UF+-10% 10V	For No. JA2296-8
	C6101R	AA10872R	CHIP CAPACITOR 0.1UF+-10% 10V	For No. JA2296-7
	C6101R	AA10872R	CHIP CAPACITOR 0.1UF+-10% 10V	For No. JA2296-8
	C6102L	893354	CHIP CAPACITOR 0.015UF+-10% 16V	For No. JA2296-7
	C6102L	893354	CHIP CAPACITOR 0.015UF+-10% 16V	For No. JA2296-8
	C6102R	893354	CHIP CAPACITOR 0.015UF+-10% 16V	For No. JA2296-7
	C6102R	893354	CHIP CAPACITOR 0.015UF+-10% 16V	For No. JA2296-8
	C6103L	893358	CHIP CAPACITOR 0.033UF+-10% 16V	For No. JA2296-7
	C6103L	893358	CHIP CAPACITOR 0.033UF+-10% 16V	For No. JA2296-8
	C6103R	893358	CHIP CAPACITOR 0.033UF+-10% 16V	For No. JA2296-7
	C6103R	893358	CHIP CAPACITOR 0.033UF+-10% 16V	For No. JA2296-8
	C6104L	893278	CERAMIC CHIP 150PF+-5% 50V	For No. JA2296-7
	C6104L	893278	CERAMIC CHIP 150PF+-5% 50V	For No. JA2296-8
	C6104R	893278	CERAMIC CHIP 150PF+-5% 50V	For No. JA2296-7
	C6104R	893278	CERAMIC CHIP 150PF+-5% 50V	For No. JA2296-8
	C6105L	AA01143R	CHIP CAPACITOR 0.22UF 16V	For No. JA2296-7

Parts List				
Caution	**Symbol No.**	**Part No.**	**Description**	**Note**
	C6105L	AA01143R	CHIP CAPACITOR 0.22UF 16V	For No. JA2296-8
	C6105R	AA01143R	CHIP CAPACITOR 0.22UF 16V	For No. JA2296-7
	C6105R	AA01143R	CHIP CAPACITOR 0.22UF 16V	For No. JA2296-8
	C6106	AA00968R	CERAMIC CAPACITOR 10UF+-20% 6.3V	For No. JA2296-7
	C6106	AA00968R	CERAMIC CAPACITOR 10UF+-20% 6.3V	For No. JA2296-8
	C6107L	893331	CHIP CAPACITOR 6800PF+-10% 25V	For No. JA2296-7
	C6107L	893331	CHIP CAPACITOR 6800PF+-10% 25V	For No. JA2296-8
	C6107R	893331	CHIP CAPACITOR 6800PF+-10% 25V	For No. JA2296-7
	C6107R	893331	CHIP CAPACITOR 6800PF+-10% 25V	For No. JA2296-8
	C6108L	AA01143R	CHIP CAPACITOR 0.22UF 16V	For No. JA2296-7
	C6108L	AA01143R	CHIP CAPACITOR 0.22UF 16V	For No. JA2296-8
	C6108R	AA01143R	CHIP CAPACITOR 0.22UF 16V	For No. JA2296-7
	C6108R	AA01143R	CHIP CAPACITOR 0.22UF 16V	For No. JA2296-8
	C6109L	893333	CERAMIC CHIP 0.01UF+-10% 16V	For No. JA2296-7
	C6109L	893333	CERAMIC CHIP 0.01UF+-10% 16V	For No. JA2296-8
	C6109R	893333	CERAMIC CHIP 0.01UF+-10% 16V	For No. JA2296-7
	C6109R	893333	CERAMIC CHIP 0.01UF+-10% 16V	For No. JA2296-8
	C6111	AA00968R	CERAMIC CAPACITOR 10UF+-20% 6.3V	For No. JA2296-7
	C6111	AA00968R	CERAMIC CAPACITOR 10UF+-20% 6.3V	For No. JA2296-8
	C6112	AA00968R	CERAMIC CAPACITOR 10UF+-20% 6.3V	For No. JA2296-7
	C6112	AA00968R	CERAMIC CAPACITOR 10UF+-20% 6.3V	For No. JA2296-8
	C6201L	AA01143R	CHIP CAPACITOR 0.22UF 16V	For No. JA2296-7
	C6201L	AA01143R	CHIP CAPACITOR 0.22UF 16V	For No. JA2296-8
	C6201R	AA01143R	CHIP CAPACITOR 0.22UF 16V	For No. JA2296-7
	C6201R	AA01143R	CHIP CAPACITOR 0.22UF 16V	For No. JA2296-8
	C6203L	AA01111R	CERAMIC CHIP 1UF 6.3V	For No. JA2296-7
	C6203L	AA01111R	CERAMIC CHIP 1UF 6.3V	For No. JA2296-8
	C6203R	AA01111R	CERAMIC CHIP 1UF 6.3V	For No. JA2296-7
	C6203R	AA01111R	CERAMIC CHIP 1UF 6.3V	For No. JA2296-8
	C6204	AA01113R	CHIP CAPACITOR 2.2UF+-10% 6.3V	For No. JA2296-7
	C6204	AA01113R	CHIP CAPACITOR 2.2UF+-10% 6.3V	For No. JA2296-8
	C6205	AA00968R	CERAMIC CAPACITOR 10UF+-20% 6.3V	For No. JA2296-7
	C6205	AA00968R	CERAMIC CAPACITOR 10UF+-20% 6.3V	For No. JA2296-8
	C6206	AA01111R	CERAMIC CHIP 1UF 6.3V	For No. JA2296-7
	C6206	AA01111R	CERAMIC CHIP 1UF 6.3V	For No. JA2296-8
	C6207	AA01111R	CERAMIC CHIP 1UF 6.3V	For No. JA2296-7
	C6207	AA01111R	CERAMIC CHIP 1UF 6.3V	For No. JA2296-8
	C6301	AA00968R	CERAMIC CAPACITOR 10UF+-20% 6.3V	For No. JA2296-7
	C6301	AA00968R	CERAMIC CAPACITOR 10UF+-20% 6.3V	For No. JA2296-8
	C6302	AA00966R	CHIP CAPACITOR 4.7UF+-20% 6.3V	For No. JA2296-7
	C6302	AA00966R	CHIP CAPACITOR 4.7UF+-20% 6.3V	For No. JA2296-8
	C6303L	AA01113R	CHIP CAPACITOR 2.2UF+-10% 6.3V	For No. JA2296-7
	C6303L	AA01113R	CHIP CAPACITOR 2.2UF+-10% 6.3V	For No. JA2296-8
	C6303R	AA01113R	CHIP CAPACITOR 2.2UF+-10% 6.3V	For No. JA2296-7
	C6303R	AA01113R	CHIP CAPACITOR 2.2UF+-10% 6.3V	For No. JA2296-8
	C6304L	AD10991R	CHIP CAPACITOR 22UF 4V	For No. JA2296-7
	C6304L	AD10991R	CHIP CAPACITOR 22UF 4V	For No. JA2296-8
	C6304R	AD10991R	CHIP CAPACITOR 22UF 4V	For No. JA2296-7
	C6304R	AD10991R	CHIP CAPACITOR 22UF 4V	For No. JA2296-8

Parts List				
Caution	**Symbol No.**	**Part No.**	**Description**	**Note**
	C6305	AA10872R	CHIP CAPACITOR 0.1UF+-10% 10V	For No. JA2296-7
	C6305	AA10872R	CHIP CAPACITOR 0.1UF+-10% 10V	For No. JA2296-8
	C6306	AA00968R	CERAMIC CAPACITOR 10UF+-20% 6.3V	For No. JA2296-7
	C6306	AA00968R	CERAMIC CAPACITOR 10UF+-20% 6.3V	For No. JA2296-8
	C6307L	AA01111R	CERAMIC CHIP 1UF 6.3V	For No. JA2296-7
	C6307L	AA01111R	CERAMIC CHIP 1UF 6.3V	For No. JA2296-8
	C6307R	AA01111R	CERAMIC CHIP 1UF 6.3V	For No. JA2296-7
	C6307R	AA01111R	CERAMIC CHIP 1UF 6.3V	For No. JA2296-8
	C6308	AA01111R	CERAMIC CHIP 1UF 6.3V	For No. JA2296-7
	C6308	AA01111R	CERAMIC CHIP 1UF 6.3V	For No. JA2296-8
	C6309	893319	CERAMIC CHIP 1000PF+-10% 50V	For No. JA2296-7
	C6309	893319	CERAMIC CHIP 1000PF+-10% 50V	For No. JA2296-8
	C6311	AA00968R	CERAMIC CAPACITOR 10UF+-20% 6.3V	For No. JA2296-7
	C6311	AA00968R	CERAMIC CAPACITOR 10UF+-20% 6.3V	For No. JA2296-8
	C6312	AA00968R	CERAMIC CAPACITOR 10UF+-20% 6.3V	For No. JA2296-7
	C6312	AA00968R	CERAMIC CAPACITOR 10UF+-20% 6.3V	For No. JA2296-8
	C6313	AA01111R	CERAMIC CHIP 1UF 6.3V	For No. JA2296-7
	C6313	AA01111R	CERAMIC CHIP 1UF 6.3V	For No. JA2296-8
	C6314	AA00968R	CERAMIC CAPACITOR 10UF+-20% 6.3V	For No. JA2296-7
	C6314	AA00968R	CERAMIC CAPACITOR 10UF+-20% 6.3V	For No. JA2296-8
	C6315	AA00968R	CERAMIC CAPACITOR 10UF+-20% 6.3V	For No. JA2296-7
	C6315	AA00968R	CERAMIC CAPACITOR 10UF+-20% 6.3V	For No. JA2296-8
	C6317	893333	CERAMIC CHIP 0.01UF+-10% 16V	For No. JA2296-7
	C6317	893333	CERAMIC CHIP 0.01UF+-10% 16V	For No. JA2296-8
	C6318	AD10891R	CHIP CAPACITOR 100UF+-20% 6.3V	For No. JA2296-7
	C6318	AD10891R	CHIP CAPACITOR 100UF+-20% 6.3V	For No. JA2296-8
	C6319	AA01113R	CHIP CAPACITOR 2.2UF+-10% 6.3V	For No. JA2296-7
	C6319	AA01113R	CHIP CAPACITOR 2.2UF+-10% 6.3V	For No. JA2296-8
	C6320	AA00968R	CERAMIC CAPACITOR 10UF+-20% 6.3V	For No. JA2296-7
	C6320	AA00968R	CERAMIC CAPACITOR 10UF+-20% 6.3V	For No. JA2296-8
	C6322	AA01113R	CHIP CAPACITOR 2.2UF+-10% 6.3V	For No. JA2296-7
	C6322	AA01113R	CHIP CAPACITOR 2.2UF+-10% 6.3V	For No. JA2296-8
	C6323	AD10891R	CHIP CAPACITOR 100UF+-20% 6.3V	For No. JA2296-7
	C6323	AD10891R	CHIP CAPACITOR 100UF+-20% 6.3V	For No. JA2296-8
	C6324	893333	CERAMIC CHIP 0.01UF+-10% 16V	For No. JA2296-7
	C6324	893333	CERAMIC CHIP 0.01UF+-10% 16V	For No. JA2296-8
	C6327	AA10872R	CHIP CAPACITOR 0.1UF+-10% 10V	For No. JA2296-7
	C6327	AA10872R	CHIP CAPACITOR 0.1UF+-10% 10V	For No. JA2296-8
	C6328	893333	CERAMIC CHIP 0.01UF+-10% 16V	For No. JA2296-7
	C6328	893333	CERAMIC CHIP 0.01UF+-10% 16V	For No. JA2296-8
	C6329	AA00966R	CHIP CAPACITOR 4.7UF+-20% 6.3V	For No. JA2296-7
	C6329	AA00966R	CHIP CAPACITOR 4.7UF+-20% 6.3V	For No. JA2296-8
	C6330	AD10891R	CHIP CAPACITOR 100UF+-20% 6.3V	For No. JA2296-7
	C6330	AD10891R	CHIP CAPACITOR 100UF+-20% 6.3V	For No. JA2296-8
	C6331	AA10872R	CHIP CAPACITOR 0.1UF+-10% 10V	For No. JA2296-7
	C6331	AA10872R	CHIP CAPACITOR 0.1UF+-10% 10V	For No. JA2296-8
	C6332	893333	CERAMIC CHIP 0.01UF+-10% 16V	For No. JA2296-7
	C6332	893333	CERAMIC CHIP 0.01UF+-10% 16V	For No. JA2296-8
	C6333	893333	CERAMIC CHIP 0.01UF+-10% 16V	For No. JA2296-7

Parts List				
Caution	**Symbol No.**	**Part No.**	**Description**	**Note**
	C6333	893333	CERAMIC CHIP 0.01UF+-10% 16V	For No. JA2296-8
	C6334	AA10872R	CHIP CAPACITOR 0.1UF+-10% 10V	For No. JA2296-7
	C6334	AA10872R	CHIP CAPACITOR 0.1UF+-10% 10V	For No. JA2296-8
	C8001	AA01111R	CERAMIC CHIP 1UF 6.3V	For No. JA2296-7
	C8001	AA01111R	CERAMIC CHIP 1UF 6.3V	For No. JA2296-8
	C8002	AA01111R	CERAMIC CHIP 1UF 6.3V	For No. JA2296-7
	C8002	AA01111R	CERAMIC CHIP 1UF 6.3V	For No. JA2296-8
	C8003	AA10872R	CHIP CAPACITOR 0.1UF+-10% 10V	For No. JA2296-7
	C8003	AA10872R	CHIP CAPACITOR 0.1UF+-10% 10V	For No. JA2296-8
	C8005	AA10872R	CHIP CAPACITOR 0.1UF+-10% 10V	For No. JA2296-7
	C8005	AA10872R	CHIP CAPACITOR 0.1UF+-10% 10V	For No. JA2296-8
	C8006	AA10872R	CHIP CAPACITOR 0.1UF+-10% 10V	For No. JA2296-7
	C8006	AA10872R	CHIP CAPACITOR 0.1UF+-10% 10V	For No. JA2296-8
	C8011	893319	CERAMIC CHIP 1000PF+-10% 50V	For No. JA2296-7
	C8011	893319	CERAMIC CHIP 1000PF+-10% 50V	For No. JA2296-8
	C8061	AA00968R	CERAMIC CAPACITOR 10UF+-20% 6.3V	For No. JA2296-7
	C8061	AA00968R	CERAMIC CAPACITOR 10UF+-20% 6.3V	For No. JA2296-8
	C8062	AA10872R	CHIP CAPACITOR 0.1UF+-10% 10V	For No. JA2296-7
	C8062	AA10872R	CHIP CAPACITOR 0.1UF+-10% 10V	For No. JA2296-8
	CP5001	BM10631R	COIL	For No. JA2296-7
	CP5001	BM10631R	COIL	For No. JA2296-8
	D0501	CC00632R	DIODE RB491D	
	D0502	CC12072R	DIODE SBS004	
	D0503	CC12072R	DIODE SBS004	
	D0504	CC12072R	DIODE SBS004	
	D0505	CC00632R	DIODE RB491D	
	D0506	CC00632R	DIODE RB491D	
	D0507	CC00632R	DIODE RB491D	
	D0508	CC11191R	DIODE 1SS388	
	D0509	CC11191R	DIODE 1SS388	
	D0510	CC11191R	DIODE 1SS388	
	D0511	CC11191R	DIODE 1SS388	
	D0512	5337351	DIODE MA132WK	
	D0513	5337351	DIODE MA132WK	
	D1001	5337353	DIODE MA132K	
	D1001A	5337353	DIODE MA132K	
	D1001B	5337353	DIODE MA132K	
	D1002	5337353	DIODE MA132K	
	D1801	CC13061R	DIODE DAP222	
	D2000	CC11541R	DIODE RB521S-30	
	D2002	CC11541R	DIODE RB521S-30	
	D2003	CC13041R	DIODE SDS7000EF	
	D2004	CC11541R	DIODE RB521S-30	
	D4001	CC11532R	DIODE HVC375B	
	D4002	CC11532R	DIODE HVC375B	
	D6001	5337353	DIODE MA132K	For No. JA2296-7
	D6001	5337353	DIODE MA132K	For No. JA2296-8
⚠	F0501	FM10601R	FUSE	
⚠	F0502	FM10601R	FUSE	

Parts List				
Caution	**Symbol No.**	**Part No.**	**Description**	**Note**
⚠	F0503	FM10601R	FUSE	
⚠	F0504	FM10601R	FUSE	
	IC0501	CK48811R	IC MB39A115	
	IC0502	CK48061R	IC MB39A110	
	IC0503	CK48821R	IC TK11251CMC	
	IC0504	CK48821R	IC TK11251CMC	
	IC0505	CK41503R	IC TK72175CM	
	IC1001	UE17151	SENSOR ASSY	For GX20A
	IC1001B	UE17171	SENSOR ASSY	For MV730A
	IC1001B	UE17161	SENSOR ASSY	For MV780A
	IC1301	CK46701U	IC UPD168153	
	IC1302	CK49831R	IC NJM13404R-TE1	
	IC1303	CK40232R	IC SN74AHC1G66HDCK	
	IC1305	CK49821R	IC NJM13403V-TE1	
	IC1306	CK49831R	IC NJM13404R-TE1	
	IC1307	CK49841R	IC NJM3414AV-TE1	
	IC1308	CK18021R	IC MB88347PFV	
	IC1401	FU10795R	GYRO SENSOR	
	IC1401A	FU10795R	GYRO SENSOR	
	IC1401B	FU10795R	GYRO SENSOR	
	IC1402	FU10796R	GYRO SENSOR	
	IC1402A	FU10796R	GYRO SENSOR	
	IC1402B	FU10796R	GYRO SENSOR	
	IC1403	CK49921R	IC NJU7018V-TE1	
	IC1403A	CK49921R	IC NJU7018V-TE1	
	IC1403B	CK49921R	IC NJU7018V-TE1	
	IC1801	CE10291R	SENSOR,REMOTE(RS-771)	
	IC2001	CK49471R	IC SN74ALVC04PWR	
	IC2001	CK43292R	IC SN74LVC04APWR-ZF	
	IC2002	CK47971R	IC HD49343HNP	
	IC2002	CK47972R	IC HD49343NP	
	IC2003	CK47971R	IC HD49343HNP	
	IC2004	CK12062R	IC UPD16510GR-8JG-E1	
	IC2005	CK47131R	IC BR9016ARFV-WE2	
	IC2006	CK47961U	IC TWINKLE-D	
	IC2007	CK49541R	IC TC7W126FU	
	IC2008	CK49881R	IC NJM2872AF34-TE1Z	
	IC3701	CK43974R	IC NJM2872AF25	For No. JA2296-7
	IC3701	CK43974R	IC NJM2872AF25	For No. JA2296-8
	IC4002	CK47211U	IC TWINKLE-C	
	IC4003	CK49621U	IC K4M28163PF-BG75	
	IC4004	CK49641U	IC K4S56163PF-BG75	
	IC4005	CK60111U	IC MBM29DL32TF70PBT	
	IC4006	CK47831R	IC RX-5411LD	
	IC4007	CK42482R	IC SN74LV1G08DCKR	
	IC4008	CK42482R	IC SN74LV1G08DCKR	
	IC4009	CK41123R	IC S-814A33AMC	
	IC4010	CK48111R	IC HD74LV1GW97A	
	IC4011	CK40232R	IC SN74AHC1G66HDCK	

Parts List				
Caution	**Symbol No.**	**Part No.**	**Description**	**Note**
	IC4012	CK49771R	IC S-80952CNNB	
	IC4013	CK49771R	IC S-80952CNNB	
	IC6021	CK60151R	IC MM1503XNRE-LF	For No. JA2296-7
	IC6021	CK60151R	IC MM1503XNRE-LF	For No. JA2296-8
	IC6101	CK49891R	IC NJM2112V-TE1Z	For No. JA2296-7
	IC6101	CK49891R	IC NJM2112V-TE1Z	For No. JA2296-8
	IC6201	CK42521R	IC AK4565VF	For No. JA2296-7
	IC6201	CK42521R	IC AK4565VF	For No. JA2296-8
	IC6301	CK42511U	IC AN2903FJQ-V	For No. JA2296-7
	IC6301	CK42511U	IC AN2903FJQ-V	For No. JA2296-8
	IC8001	CK43971R	IC NJM2872AF34	For No. JA2296-7
	IC8001	CK43971R	IC NJM2872AF34	For No. JA2296-8
	J7001	EA15291R	PLUG	For No. JA2296-7
	J7001	EA15291R	PLUG	For No. JA2296-8
	JK1901	EY11581R	JACK(8P)	
	JK1902	ER10591	JACK	
	JK1903	EY11801R	JACK,USB	
	L0151	BA10571R	COIL	
	L0501	BA10577R	COIL 10UH	
	L0502	BA11971R	COIL	
	L0503	BA11971R	COIL	
	L0504	BA11974R	COIL	
	L0505	BA11974R	COIL	
	L0506	BA11974R	COIL	
	L0507	BA11973R	COIL	
	L0508	BA11975R	COIL	
	L0509	BA11974R	COIL	
	L0510	BA11975R	COIL	
	L0512	BA10584R	COIL 100UH	
	L0512	BA10577R	COIL 10UH	
	L0513	BA10577R	COIL 10UH	
	L2000	BA10575R	COIL	
	L2001	BA10149R	COIL 33UH	
	L2003	BA10575R	COIL	
	L2003	BA10577R	COIL 10UH	
	L2004	BA10577R	COIL 10UH	
	L2005	BA10577R	COIL 10UH	
	L2007	BA10155R	COIL	
	L2008	BA10143R	COIL 10UH	
	L2009	BA10142R	COIL	
	L2012	BA10577R	COIL 10UH	
	L3701	BA10577R	COIL 10UH	For No. JA2296-7
	L3701	BA10577R	COIL 10UH	For No. JA2296-8
	L3702	BA10581R	COIL	For No. JA2296-7
	L3702	BA10581R	COIL	For No. JA2296-8
	L4002	BA10577R	COIL 10UH	
	L4004	BA10577R	COIL 10UH	
	L4005	BA10577R	COIL 10UH	
	L6021	BA10149R	COIL 33UH	For No. JA2296-7

Parts List				
Caution	**Symbol No.**	**Part No.**	**Description**	**Note**
	L6021	BA10149R	COIL 33UH	For No. JA2296-8
	L6101	773004	COIL 100UH	For No. JA2296-7
	L6101	773004	COIL 100UH	For No. JA2296-8
	L6301	BA10584R	COIL 100UH	For No. JA2296-7
	L6301	BA10584R	COIL 100UH	For No. JA2296-8
	L6302	BA10577R	COIL 10UH	For No. JA2296-7
	L6302	BA10577R	COIL 10UH	For No. JA2296-8
	L6303	BA10577R	COIL 10UH	For No. JA2296-7
	L6303	BA10577R	COIL 10UH	For No. JA2296-8
	L6304	BA10577R	COIL 10UH	For No. JA2296-7
	L6304	BA10577R	COIL 10UH	For No. JA2296-8
	L6305	BA10582R	COIL 47UH	For No. JA2296-7
	L6305	BA10582R	COIL 47UH	For No. JA2296-8
	L6306	BA10577R	COIL 10UH	For No. JA2296-7
	L6306	BA10577R	COIL 10UH	For No. JA2296-8
	LD1802	CC12281R	DIODE TLRMV1020-F	
	LD8061	CC12281R	DIODE TLRMV1020-F	For No. JA2296-7
	LD8061	CC12281R	DIODE TLRMV1020-F	For No. JA2296-8
	PD1801	CH12281	DIODE PD410P12E00F	
	PG0151	EA15031R	PLUG	
	PG0152	EA15071R	PLUG	
	PG0501	EA15602R	PLUG	
	PG1001	EA15035R	PLUG	
	PG1001A	EA15035R	PLUG	
	PG1001B	EA15035R	PLUG	
	PG1301	EA15123R	PLUG	
	PG1301A	EA15122R	PLUG	
	PG1801	EA14631R	PLUG	
	PG1802	EA15601R	PLUG	
	PG1901	EA15031R	PLUG	
	PG2001	EA15025R	PLUG	
	PG2301	EA15034R	PLUG	
	PG2302	EA15401R	PLUG	
	PG3701	EA15381R	PLUG	For No. JA2296-7
	PG3701	EA15381R	PLUG	For No. JA2296-8
	PG4001	FU10692R	CONTACT	
	PG4002	FU10692R	CONTACT	
	PG4003	FU10692R	CONTACT	
	PG4004	FU10501R	CONTACT	
	PG4005	FU10501R	CONTACT	
	PG4006	FU10501R	CONTACT	
	PG6001	EA14621R	PLUG	For No. JA2296-7
	PG6001	EA14621R	PLUG	For No. JA2296-8
	PG6002	EA15021R	PLUG	For No. JA2296-7
	PG6002	EA15021R	PLUG	For No. JA2296-8
	PG6003	EA15581R	PLUG	For No. JA2296-7
	PG6003	EA15581R	PLUG	For No. JA2296-8
	PG7001	EA15011R	PLUG	
	PG7002	EA15024R	PLUG	

Parts List				
Caution	**Symbol No.**	**Part No.**	**Description**	**Note**
	PG7004	EA15603R	PLUG	
	PG8001	EA15001R	PLUG	For No. JA2296-7
	PG8001	EA15001R	PLUG	For No. JA2296-8
	PG8002	EA15091R	PLUG	For No. JA2296-7
	PG8002	EA15091R	PLUG	For No. JA2296-8
	PG8003	EA15261R	PLUG	For No. JA2296-7
	PG8003	EA15261R	PLUG	For No. JA2296-8
	PG8004	EA15021R	PLUG	For No. JA2296-7
	PG8004	EA15021R	PLUG	For No. JA2296-8
	PG8011	EA15411R	PLUG	For No. JA2296-7
	PG8011	EA15411R	PLUG	For No. JA2296-8
	PG8061	EZ10891	CONNECTOR(SD)	For No. JA2296-7
	PG8061	EZ10891	CONNECTOR(SD)	For No. JA2296-8
	Q0501	CA13501R	TRANSISTOR MCH3310-TL	
	Q0502	CA14131R	TRANSISTOR MCH3408	
	Q0503	CA13501R	TRANSISTOR MCH3310-TL	
	Q0504	CA13501R	TRANSISTOR MCH3310-TL	
	Q0505	CA13501R	TRANSISTOR MCH3310-TL	
	Q0506	CA13501R	TRANSISTOR MCH3310-TL	
	Q0507	CA14131R	TRANSISTOR MCH3408	
	Q0508	CA13501R	TRANSISTOR MCH3310-TL	
	Q0509	CA14131R	TRANSISTOR MCH3408	
	Q0510	CA13501R	TRANSISTOR MCH3310-TL	
	Q0511	CA14311R	TRANSISTOR MCH3414	
	Q1001	CA14061R	TRANSISTOR 2SC4627J	
	Q1001A	CA14061R	TRANSISTOR 2SC4627J	
	Q1001B	CA13472R	TRANSISTOR 2SC4626J	
	Q1002	CA14061R	TRANSISTOR 2SC4627J	
	Q1002A	CA13472R	TRANSISTOR 2SC4626J	
	Q1003A	1323279	TRANSISTOR DTC114YE	
	Q1302	CA14151R	TRANSISTOR 2SB1705TL	
	Q1303	CA12891R	TRANSISTOR RT1N144U-T11-1	
	Q1305	CA14091R	TRANSISTOR 2SC5343E-CL	
	Q1401	1323252	TRANSISTOR XP4501	
	Q1401A	1323252	TRANSISTOR XP4501	
	Q1401B	1323252	TRANSISTOR XP4501	
	Q1402	CA12502R	TRANSISTOR 2SC5383-T11-1F	
	Q1402A	CA12502R	TRANSISTOR 2SC5383-T11-1F	
	Q1402B	CA12502R	TRANSISTOR 2SC5383-T11-1F	
	Q1802	CA12501R	TRANSISTOR 2SC5383-T11	
	Q1803	CA11373R	TRANSISTOR 2SD2345JSL	
	Q2000	CA12911R	TRANSISTOR 2SA1989-T11-1R	
	Q2001	CA02161R	TRANSISTOR SUT485J	
	Q2004	CA12871R	TRANSISTOR RT1P144U-T11-1	
	Q2005	CA12891R	TRANSISTOR RT1N144U-T11-1	
	Q6001L	CA14091R	TRANSISTOR 2SC5343E-CL	For No. JA2296-7
	Q6001L	CA14091R	TRANSISTOR 2SC5343E-CL	For No. JA2296-8
	Q6001R	CA14091R	TRANSISTOR 2SC5343E-CL	For No. JA2296-7
	Q6001R	CA14091R	TRANSISTOR 2SC5343E-CL	For No. JA2296-8

Parts List				
Caution	**Symbol No.**	**Part No.**	**Description**	**Note**
	Q6002L	CA14121R	TRANSISTOR 2SA1980EF-AY	For No. JA2296-7
	Q6002L	CA14121R	TRANSISTOR 2SA1980EF-AY	For No. JA2296-8
	Q6002R	CA14121R	TRANSISTOR 2SA1980EF-AY	For No. JA2296-7
	Q6002R	CA14121R	TRANSISTOR 2SA1980EF-AY	For No. JA2296-8
	Q6003	CA14091R	TRANSISTOR 2SC5343E-CL	For No. JA2296-7
	Q6003	CA14091R	TRANSISTOR 2SC5343E-CL	For No. JA2296-8
	Q6004	CA12871R	TRANSISTOR RT1P144U-T11-1	For No. JA2296-7
	Q6004	CA12871R	TRANSISTOR RT1P144U-T11-1	For No. JA2296-8
	Q6021	CA12871R	TRANSISTOR RT1P144U-T11-1	For No. JA2296-7
	Q6021	CA12871R	TRANSISTOR RT1P144U-T11-1	For No. JA2296-8
	Q6022	CA12891R	TRANSISTOR RT1N144U-T11-1	For No. JA2296-7
	Q6022	CA12891R	TRANSISTOR RT1N144U-T11-1	For No. JA2296-8
	Q6023	CA12871R	TRANSISTOR RT1P144U-T11-1	For No. JA2296-7
	Q6023	CA12871R	TRANSISTOR RT1P144U-T11-1	For No. JA2296-8
	Q6024	CA12891R	TRANSISTOR RT1N144U-T11-1	For No. JA2296-7
	Q6024	CA12891R	TRANSISTOR RT1N144U-T11-1	For No. JA2296-8
	Q6027	CA14091R	TRANSISTOR 2SC5343E-CL	For No. JA2296-7
	Q6027	CA14091R	TRANSISTOR 2SC5343E-CL	For No. JA2296-8
	Q6028	CA14091R	TRANSISTOR 2SC5343E-CL	For No. JA2296-7
	Q6028	CA14091R	TRANSISTOR 2SC5343E-CL	For No. JA2296-8
	Q6029	CA14091R	TRANSISTOR 2SC5343E-CL	For No. JA2296-7
	Q6029	CA14091R	TRANSISTOR 2SC5343E-CL	For No. JA2296-8
	Q6030	CA14091R	TRANSISTOR 2SC5343E-CL	For No. JA2296-7
	Q6030	CA14091R	TRANSISTOR 2SC5343E-CL	For No. JA2296-8
	Q6031	CA14091R	TRANSISTOR 2SC5343E-CL	For No. JA2296-7
	Q6031	CA14091R	TRANSISTOR 2SC5343E-CL	For No. JA2296-8
	Q6032	CA02111R	TRANSISTOR SUT483J	For No. JA2296-7
	Q6032	CA02111R	TRANSISTOR SUT483J	For No. JA2296-8
	Q6101L	CA14091R	TRANSISTOR 2SC5343E-CL	For No. JA2296-7
	Q6101L	CA14091R	TRANSISTOR 2SC5343E-CL	For No. JA2296-8
	Q6101R	CA14091R	TRANSISTOR 2SC5343E-CL	For No. JA2296-7
	Q6101R	CA14091R	TRANSISTOR 2SC5343E-CL	For No. JA2296-8
	Q6102L	CA12781R	TRANSISTOR RT1N241U-T11-1	For No. JA2296-7
	Q6102L	CA12781R	TRANSISTOR RT1N241U-T11-1	For No. JA2296-8
	Q6102R	CA12781R	TRANSISTOR RT1N241U-T11-1	For No. JA2296-7
	Q6102R	CA12781R	TRANSISTOR RT1N241U-T11-1	For No. JA2296-8
	Q6103L	CA14091R	TRANSISTOR 2SC5343E-CL	For No. JA2296-7
	Q6103L	CA14091R	TRANSISTOR 2SC5343E-CL	For No. JA2296-8
	Q6103R	CA14091R	TRANSISTOR 2SC5343E-CL	For No. JA2296-7
	Q6103R	CA14091R	TRANSISTOR 2SC5343E-CL	For No. JA2296-8
	Q6104L	CA14091R	TRANSISTOR 2SC5343E-CL	For No. JA2296-7
	Q6104L	CA14091R	TRANSISTOR 2SC5343E-CL	For No. JA2296-8
	Q6104R	CA14091R	TRANSISTOR 2SC5343E-CL	For No. JA2296-7
	Q6104R	CA14091R	TRANSISTOR 2SC5343E-CL	For No. JA2296-8
	Q6105	CA14091R	TRANSISTOR 2SC5343E-CL	For No. JA2296-7
	Q6105	CA14091R	TRANSISTOR 2SC5343E-CL	For No. JA2296-8
	Q6301	CA14101R	TRANSISTOR MUN5214DW1T1	For No. JA2296-7
	Q6301	CA14101R	TRANSISTOR MUN5214DW1T1	For No. JA2296-8
	Q7001	CA12891R	TRANSISTOR RT1N144U-T11-1	

Parts List				
Caution	**Symbol No.**	**Part No.**	**Description**	**Note**
	Q7002	CA12891R	TRANSISTOR RT1N144U-T11-1	
	Q8001	CA14081R	TRANSISTOR RTR020P02TL	For No. JA2296-7
	Q8001	CA14081R	TRANSISTOR RTR020P02TL	For No. JA2296-8
	Q8002	CA12891R	TRANSISTOR RT1N144U-T11-1	For No. JA2296-7
	Q8002	CA12891R	TRANSISTOR RT1N144U-T11-1	For No. JA2296-8
	R1001	790019	CHIP RESISTOR 47 OHM+-5% 1/16W	
	R1001A	790044	CHIP RESISTOR 3.3KOHM+-5% 1/16W	
	R1001B	790024	CHIP RESISTOR 100 OHM+-5% 1/16W	
	R1002	790024	CHIP RESISTOR 100 OHM+-5% 1/16W	
	R1002A	790039	CHIP RESISTOR 1.5KOHM+-5% 1/16W	
	R1002B	790044	CHIP RESISTOR 3.3KOHM+-5% 1/16W	
	R1003	790036	CHIP RESISTOR 820 OHM+-5% 1/16W	
	R1003A	790051	CHIP RESISTOR 10KOHM+-5% 1/16W	
	R1003B	790064	CHIP RESISTOR 100KOHM+-5% 1/16W	
	R1004	790019	CHIP RESISTOR 47 OHM+-5% 1/16W	
	R1004A	790051	CHIP RESISTOR 10KOHM+-5% 1/16W	
	R1004B	790015	CHIP RESISTOR 22 OHM+-5% 1/16W	
	R1005	790024	CHIP RESISTOR 100 OHM+-5% 1/16W	
	R1005A	790064	CHIP RESISTOR 100KOHM+-5% 1/16W	
	R1006	790036	CHIP RESISTOR 820 OHM+-5% 1/16W	
	R1006A	790015	CHIP RESISTOR 22 OHM+-5% 1/16W	
	R1007	790007	CHIP RESISTOR 5.6 OHM+-5% 1/16W	
	R1010	790064	CHIP RESISTOR 100KOHM+-5% 1/16W	
	R1401	790045	CHIP RESISTOR 3.9KOHM+-5% 1/16W	
	R1401A	790045	CHIP RESISTOR 3.9KOHM+-5% 1/16W	
	R1401B	790045	CHIP RESISTOR 3.9KOHM+-5% 1/16W	
	R1402	790045	CHIP RESISTOR 3.9KOHM+-5% 1/16W	
	R1402A	790045	CHIP RESISTOR 3.9KOHM+-5% 1/16W	
	R1402B	790045	CHIP RESISTOR 3.9KOHM+-5% 1/16W	
	R1403	790044	CHIP RESISTOR 3.3KOHM+-5% 1/16W	
	R1403A	790044	CHIP RESISTOR 3.3KOHM+-5% 1/16W	
	R1403B	790044	CHIP RESISTOR 3.3KOHM+-5% 1/16W	
	R1404	790044	CHIP RESISTOR 3.3KOHM+-5% 1/16W	
	R1404A	790044	CHIP RESISTOR 3.3KOHM+-5% 1/16W	
	R1404B	790044	CHIP RESISTOR 3.3KOHM+-5% 1/16W	
	R1405	790037	CHIP RESISTOR 1KOHM+-5% 1/16W	
	R1405A	790037	CHIP RESISTOR 1KOHM+-5% 1/16W	
	R1405B	790037	CHIP RESISTOR 1KOHM+-5% 1/16W	
	R1406	790037	CHIP RESISTOR 1KOHM+-5% 1/16W	
	R1406A	790037	CHIP RESISTOR 1KOHM+-5% 1/16W	
	R1406B	790037	CHIP RESISTOR 1KOHM+-5% 1/16W	
	R1407	AQ00269R	CHIP RESISTOR 680KOHM+-1% 0.63W	
	R1407A	AQ00269R	CHIP RESISTOR 680KOHM+-1% 0.63W	
	R1407B	AQ00269R	CHIP RESISTOR 680KOHM+-1% 0.63W	
	R1408	AQ00269R	CHIP RESISTOR 680KOHM+-1% 0.63W	
	R1408A	AQ00269R	CHIP RESISTOR 680KOHM+-1% 0.63W	
	R1408B	AQ00269R	CHIP RESISTOR 680KOHM+-1% 0.63W	
	R1409	AQ00228R	CHIP RESISTOR 20KOHM+-1% 1/16W	
	R1409A	AQ00228R	CHIP RESISTOR 20KOHM+-1% 1/16W	

Parts List				
Caution	**Symbol No.**	**Part No.**	**Description**	**Note**
	R1409B	AQ00228R	CHIP RESISTOR 20KOHM+-1% 1/16W	
	R1410	AQ00228R	CHIP RESISTOR 20KOHM+-1% 1/16W	
	R1410A	AQ00228R	CHIP RESISTOR 20KOHM+-1% 1/16W	
	R1410B	AQ00228R	CHIP RESISTOR 20KOHM+-1% 1/16W	
	R1411	790072	CHIP RESISTOR 390KOHM+-5% 1/16W	
	R1411A	790072	CHIP RESISTOR 390KOHM+-5% 1/16W	
	R1411B	790072	CHIP RESISTOR 390KOHM+-5% 1/16W	
	R1412	790072	CHIP RESISTOR 390KOHM+-5% 1/16W	
	R1412A	790072	CHIP RESISTOR 390KOHM+-5% 1/16W	
	R1412B	790072	CHIP RESISTOR 390KOHM+-5% 1/16W	
	R1413	790037	CHIP RESISTOR 1KOHM+-5% 1/16W	
	R1413A	790037	CHIP RESISTOR 1KOHM+-5% 1/16W	
	R1413B	790037	CHIP RESISTOR 1KOHM+-5% 1/16W	
	R1414	790037	CHIP RESISTOR 1KOHM+-5% 1/16W	
	R1414A	790037	CHIP RESISTOR 1KOHM+-5% 1/16W	
	R1414B	790037	CHIP RESISTOR 1KOHM+-5% 1/16W	
	R1415	790051	CHIP RESISTOR 10KOHM+-5% 1/16W	
	R1415A	790051	CHIP RESISTOR 10KOHM+-5% 1/16W	
	R1415B	790051	CHIP RESISTOR 10KOHM+-5% 1/16W	
	R1416	790028	CHIP RESISTOR 220 OHM+-5% 1/16W	
	R1416A	790028	CHIP RESISTOR 220 OHM+-5% 1/16W	
	R1416B	790028	CHIP RESISTOR 220 OHM+-5% 1/16W	
	R1417	790028	CHIP RESISTOR 220 OHM+-5% 1/16W	
	R1417A	790028	CHIP RESISTOR 220 OHM+-5% 1/16W	
	R1417B	790028	CHIP RESISTOR 220 OHM+-5% 1/16W	
	R1418	790058	CHIP RESISTOR 39KOHM+-5% 1/16W	
	R1418A	790058	CHIP RESISTOR 39KOHM+-5% 1/16W	
	R1418B	790058	CHIP RESISTOR 39KOHM+-5% 1/16W	
	R1419	790058	CHIP RESISTOR 39KOHM+-5% 1/16W	
	R1419A	790058	CHIP RESISTOR 39KOHM+-5% 1/16W	
	R1419B	790058	CHIP RESISTOR 39KOHM+-5% 1/16W	
	R1420	790046	CHIP RESISTOR 4.7KOHM+-5% 1/16W	
	R1420A	790046	CHIP RESISTOR 4.7KOHM+-5% 1/16W	
	R1420B	790046	CHIP RESISTOR 4.7KOHM+-5% 1/16W	
	R1803	104084	CHIP RESISTOR 2.2MOHM+-5% 1/16W	
	R1805	790071	CHIP RESISTOR 330KOHM+-5% 1/16W	
	R1806	790046	CHIP RESISTOR 4.7KOHM+-5% 1/16W	
	R1807	790041	CHIP RESISTOR 1.8KOHM+-5% 1/16W	
	R1811	AQ10344R	CHIP RESISTOR 10MOHM+-5% 1/16W	
	R1814	790019	CHIP RESISTOR 47 OHM+-5% 1/16W	
	R1902	790055	CHIP RESISTOR 22KOHM+-5% 1/16W	
	R3711	790014	CHIP RESISTOR 18 OHM+-5% 1/16W	For No. JA2296-7
	R3711	790014	CHIP RESISTOR 18 OHM+-5% 1/16W	For No. JA2296-8
	R3713	790181	CHIP RESISTOR 10 OHM+-5% 1/16W	For No. JA2296-7
	R3713	790181	CHIP RESISTOR 10 OHM+-5% 1/16W	For No. JA2296-8
	R3714	790181	CHIP RESISTOR 10 OHM+-5% 1/16W	For No. JA2296-7
	R3714	790181	CHIP RESISTOR 10 OHM+-5% 1/16W	For No. JA2296-8
	R3715	790181	CHIP RESISTOR 10 OHM+-5% 1/16W	For No. JA2296-7
	R3715	790181	CHIP RESISTOR 10 OHM+-5% 1/16W	For No. JA2296-8

Parts List				
Caution	**Symbol No.**	**Part No.**	**Description**	**Note**
	R3716	790181	CHIP RESISTOR 10 OHM+-5% 1/16W	For No. JA2296-7
	R3716	790181	CHIP RESISTOR 10 OHM+-5% 1/16W	For No. JA2296-8
	R3717	790181	CHIP RESISTOR 10 OHM+-5% 1/16W	For No. JA2296-7
	R3717	790181	CHIP RESISTOR 10 OHM+-5% 1/16W	For No. JA2296-8
	R3718	790181	CHIP RESISTOR 10 OHM+-5% 1/16W	For No. JA2296-7
	R3718	790181	CHIP RESISTOR 10 OHM+-5% 1/16W	For No. JA2296-8
	R5003	AQ00802R	CHIP RESISTOR 5.6KOHM+-1% 1/16W	For No. JA2296-7
	R5003	AQ00802R	CHIP RESISTOR 5.6KOHM+-1% 1/16W	For No. JA2296-8
	R5004	790247	CHIP RESISTOR 1MOHM+-5% 1/16W	For No. JA2296-7
	R5004	790247	CHIP RESISTOR 1MOHM+-5% 1/16W	For No. JA2296-8
	R5005	790207	CHIP RESISTOR 1KOHM+-5% 1/16W	For No. JA2296-7
	R5005	790207	CHIP RESISTOR 1KOHM+-5% 1/16W	For No. JA2296-8
	R6001	BM10697R	CORE	For No. JA2296-7
	R6001	BM10697R	CORE	For No. JA2296-8
	R6002L	790218	CHIP RESISTOR 6.8KOHM+-5% 1/16W	For No. JA2296-7
	R6002L	790218	CHIP RESISTOR 6.8KOHM+-5% 1/16W	For No. JA2296-8
	R6002R	790218	CHIP RESISTOR 6.8KOHM+-5% 1/16W	For No. JA2296-7
	R6002R	790218	CHIP RESISTOR 6.8KOHM+-5% 1/16W	For No. JA2296-8
	R6003L	790203	CHIP RESISTOR 470 OHM+-5% 1/16W	For No. JA2296-7
	R6003L	790203	CHIP RESISTOR 470 OHM+-5% 1/16W	For No. JA2296-8
	R6003R	790203	CHIP RESISTOR 470 OHM+-5% 1/16W	For No. JA2296-7
	R6003R	790203	CHIP RESISTOR 470 OHM+-5% 1/16W	For No. JA2296-8
	R6004L	103869	CHIP RESISTOR 150KOHM+-5% 0.1W	For No. JA2296-7
	R6004L	103869	CHIP RESISTOR 150KOHM+-5% 0.1W	For No. JA2296-8
	R6004R	103869	CHIP RESISTOR 150KOHM+-5% 0.1W	For No. JA2296-7
	R6004R	103869	CHIP RESISTOR 150KOHM+-5% 0.1W	For No. JA2296-8
	R6005L	AQ10762R	CHIP RESISTOR 56KOHM+-0.5% 1/16W	For No. JA2296-7
	R6005L	AQ10762R	CHIP RESISTOR 56KOHM+-0.5% 1/16W	For No. JA2296-8
	R6005R	AQ10762R	CHIP RESISTOR 56KOHM+-0.5% 1/16W	For No. JA2296-7
	R6005R	AQ10762R	CHIP RESISTOR 56KOHM+-0.5% 1/16W	For No. JA2296-8
	R6006L	AQ10712R	CHIP RESISTOR 10KOHM+-0.5% 1/16W	For No. JA2296-7
	R6006L	AQ10712R	CHIP RESISTOR 10KOHM+-0.5% 1/16W	For No. JA2296-8
	R6006R	AQ10712R	CHIP RESISTOR 10KOHM+-0.5% 1/16W	For No. JA2296-7
	R6006R	AQ10712R	CHIP RESISTOR 10KOHM+-0.5% 1/16W	For No. JA2296-8
	R6007L	790207	CHIP RESISTOR 1KOHM+-5% 1/16W	For No. JA2296-7
	R6007L	790207	CHIP RESISTOR 1KOHM+-5% 1/16W	For No. JA2296-8
	R6007R	790207	CHIP RESISTOR 1KOHM+-5% 1/16W	For No. JA2296-7
	R6007R	790207	CHIP RESISTOR 1KOHM+-5% 1/16W	For No. JA2296-8
	R6008L	790217	CHIP RESISTOR 5.6KOHM+-5% 1/16W	For No. JA2296-7
	R6008L	790217	CHIP RESISTOR 5.6KOHM+-5% 1/16W	For No. JA2296-8
	R6008R	790217	CHIP RESISTOR 5.6KOHM+-5% 1/16W	For No. JA2296-7
	R6008R	790217	CHIP RESISTOR 5.6KOHM+-5% 1/16W	For No. JA2296-8
	R6009L	790196	CHIP RESISTOR 150 OHM+-5% 1/16W	For No. JA2296-7
	R6009L	790196	CHIP RESISTOR 150 OHM+-5% 1/16W	For No. JA2296-8
	R6009R	790196	CHIP RESISTOR 150 OHM+-5% 1/16W	For No. JA2296-7
	R6009R	790196	CHIP RESISTOR 150 OHM+-5% 1/16W	For No. JA2296-8
	R6010	790216	CHIP RESISTOR 4.7KOHM+-5% 1/16W	For No. JA2296-7
	R6010	790216	CHIP RESISTOR 4.7KOHM+-5% 1/16W	For No. JA2296-8

Parts List				
Caution	**Symbol No.**	**Part No.**	**Description**	**Note**
	R6021	790207	CHIP RESISTOR 1KOHM+-5% 1/16W	For No. JA2296-7
	R6021	790207	CHIP RESISTOR 1KOHM+-5% 1/16W	For No. JA2296-8
	R6025	790221	CHIP RESISTOR 10KOHM+-5% 1/16W	For No. JA2296-7
	R6025	790221	CHIP RESISTOR 10KOHM+-5% 1/16W	For No. JA2296-8
	R6026	790204	CHIP RESISTOR 560 OHM+-5% 1/16W	For No. JA2296-7
	R6026	790204	CHIP RESISTOR 560 OHM+-5% 1/16W	For No. JA2296-8
	R6027	790204	CHIP RESISTOR 560 OHM+-5% 1/16W	For No. JA2296-7
	R6027	790204	CHIP RESISTOR 560 OHM+-5% 1/16W	For No. JA2296-8
	R6028	790191	CHIP RESISTOR 56 OHM+-5% 1/16W	For No. JA2296-7
	R6028	790191	CHIP RESISTOR 56 OHM+-5% 1/16W	For No. JA2296-8
	R6029	790191	CHIP RESISTOR 56 OHM+-5% 1/16W	For No. JA2296-7
	R6029	790191	CHIP RESISTOR 56 OHM+-5% 1/16W	For No. JA2296-8
	R6030	790191	CHIP RESISTOR 56 OHM+-5% 1/16W	For No. JA2296-7
	R6030	790191	CHIP RESISTOR 56 OHM+-5% 1/16W	For No. JA2296-8
	R6031	790234	CHIP RESISTOR 100KOHM+-5% 1/16W	For No. JA2296-7
	R6031	790234	CHIP RESISTOR 100KOHM+-5% 1/16W	For No. JA2296-8
	R6032	790234	CHIP RESISTOR 100KOHM+-5% 1/16W	For No. JA2296-7
	R6032	790234	CHIP RESISTOR 100KOHM+-5% 1/16W	For No. JA2296-8
	R6033	790212	CHIP RESISTOR 2.2KOHM+-5% 1/16W	For No. JA2296-7
	R6033	790212	CHIP RESISTOR 2.2KOHM+-5% 1/16W	For No. JA2296-8
	R6035	790234	CHIP RESISTOR 100KOHM+-5% 1/16W	For No. JA2296-7
	R6035	790234	CHIP RESISTOR 100KOHM+-5% 1/16W	For No. JA2296-8
	R6036	790234	CHIP RESISTOR 100KOHM+-5% 1/16W	For No. JA2296-7
	R6036	790234	CHIP RESISTOR 100KOHM+-5% 1/16W	For No. JA2296-8
	R6037	790207	CHIP RESISTOR 1KOHM+-5% 1/16W	For No. JA2296-7
	R6037	790207	CHIP RESISTOR 1KOHM+-5% 1/16W	For No. JA2296-8
	R6039	790209	CHIP RESISTOR 1.5KOHM+-5% 1/16W	For No. JA2296-7
	R6039	790209	CHIP RESISTOR 1.5KOHM+-5% 1/16W	For No. JA2296-8
	R6040	790209	CHIP RESISTOR 1.5KOHM+-5% 1/16W	For No. JA2296-7
	R6040	790209	CHIP RESISTOR 1.5KOHM+-5% 1/16W	For No. JA2296-8
	R6041	790209	CHIP RESISTOR 1.5KOHM+-5% 1/16W	For No. JA2296-7
	R6041	790209	CHIP RESISTOR 1.5KOHM+-5% 1/16W	For No. JA2296-8
	R6042	790207	CHIP RESISTOR 1KOHM+-5% 1/16W	For No. JA2296-7
	R6042	790207	CHIP RESISTOR 1KOHM+-5% 1/16W	For No. JA2296-8
	R6043	790211	CHIP RESISTOR 1.8KOHM+-5% 1/16W	For No. JA2296-7
	R6043	790211	CHIP RESISTOR 1.8KOHM+-5% 1/16W	For No. JA2296-8
	R6045	790198	CHIP RESISTOR 220 OHM+-5% 1/16W	For No. JA2296-7
	R6045	790198	CHIP RESISTOR 220 OHM+-5% 1/16W	For No. JA2296-8
	R6101L	AQ10747R	CHIP RESISTOR 3.9KOHM+-5% 1/16W	For No. JA2296-7
	R6101L	AQ10747R	CHIP RESISTOR 3.9KOHM+-5% 1/16W	For No. JA2296-8
	R6101R	AQ10747R	CHIP RESISTOR 3.9KOHM+-5% 1/16W	For No. JA2296-7
	R6101R	AQ10747R	CHIP RESISTOR 3.9KOHM+-5% 1/16W	For No. JA2296-8
	R6102L	790227	CHIP RESISTOR 33KOHM+-5% 1/16W	For No. JA2296-7
	R6102L	790227	CHIP RESISTOR 33KOHM+-5% 1/16W	For No. JA2296-8
	R6102R	790227	CHIP RESISTOR 33KOHM+-5% 1/16W	For No. JA2296-7
	R6102R	790227	CHIP RESISTOR 33KOHM+-5% 1/16W	For No. JA2296-8
	R6103L	790225	CHIP RESISTOR 22KOHM+-5% 1/16W	For No. JA2296-7
	R6103L	790225	CHIP RESISTOR 22KOHM+-5% 1/16W	For No. JA2296-8
	R6103R	790225	CHIP RESISTOR 22KOHM+-5% 1/16W	For No. JA2296-7

Parts List				
Caution	**Symbol No.**	**Part No.**	**Description**	**Note**
	R6103R	790225	CHIP RESISTOR 22KOHM+-5% 1/16W	For No. JA2296-8
	R6104L	790236	CHIP RESISTOR 150KOHM+-5% 1/16W	For No. JA2296-7
	R6104L	790236	CHIP RESISTOR 150KOHM+-5% 1/16W	For No. JA2296-8
	R6104R	790236	CHIP RESISTOR 150KOHM+-5% 1/16W	For No. JA2296-7
	R6104R	790236	CHIP RESISTOR 150KOHM+-5% 1/16W	For No. JA2296-8
	R6105L	790228	CHIP RESISTOR 39KOHM+-5% 1/16W	For No. JA2296-7
	R6105L	790228	CHIP RESISTOR 39KOHM+-5% 1/16W	For No. JA2296-8
	R6105R	790228	CHIP RESISTOR 39KOHM+-5% 1/16W	For No. JA2296-7
	R6105R	790228	CHIP RESISTOR 39KOHM+-5% 1/16W	For No. JA2296-8
	R6106L	790236	CHIP RESISTOR 150KOHM+-5% 1/16W	For No. JA2296-7
	R6106L	790236	CHIP RESISTOR 150KOHM+-5% 1/16W	For No. JA2296-8
	R6106R	790236	CHIP RESISTOR 150KOHM+-5% 1/16W	For No. JA2296-7
	R6106R	790236	CHIP RESISTOR 150KOHM+-5% 1/16W	For No. JA2296-8
	R6107L	790221	CHIP RESISTOR 10KOHM+-5% 1/16W	For No. JA2296-7
	R6107L	790221	CHIP RESISTOR 10KOHM+-5% 1/16W	For No. JA2296-8
	R6107R	790221	CHIP RESISTOR 10KOHM+-5% 1/16W	For No. JA2296-7
	R6107R	790221	CHIP RESISTOR 10KOHM+-5% 1/16W	For No. JA2296-8
	R6108L	790221	CHIP RESISTOR 10KOHM+-5% 1/16W	For No. JA2296-7
	R6108L	790221	CHIP RESISTOR 10KOHM+-5% 1/16W	For No. JA2296-8
	R6108R	790221	CHIP RESISTOR 10KOHM+-5% 1/16W	For No. JA2296-7
	R6108R	790221	CHIP RESISTOR 10KOHM+-5% 1/16W	For No. JA2296-8
	R6109	790225	CHIP RESISTOR 22KOHM+-5% 1/16W	For No. JA2296-7
	R6109	790225	CHIP RESISTOR 22KOHM+-5% 1/16W	For No. JA2296-8
	R6110	790227	CHIP RESISTOR 33KOHM+-5% 1/16W	For No. JA2296-7
	R6110	790227	CHIP RESISTOR 33KOHM+-5% 1/16W	For No. JA2296-8
	R6111L	AQ10713R	CHIP RESISTOR 100KOHM+-0.5% 1/16W	For No. JA2296-7
	R6111L	AQ10713R	CHIP RESISTOR 100KOHM+-0.5% 1/16W	For No. JA2296-8
	R6111R	AQ10713R	CHIP RESISTOR 100KOHM+-0.5% 1/16W	For No. JA2296-7
	R6111R	AQ10713R	CHIP RESISTOR 100KOHM+-0.5% 1/16W	For No. JA2296-8
	R6112L	790217	CHIP RESISTOR 5.6KOHM+-5% 1/16W	For No. JA2296-7
	R6112L	790217	CHIP RESISTOR 5.6KOHM+-5% 1/16W	For No. JA2296-8
	R6112R	790217	CHIP RESISTOR 5.6KOHM+-5% 1/16W	For No. JA2296-7
	R6112R	790217	CHIP RESISTOR 5.6KOHM+-5% 1/16W	For No. JA2296-8
	R6113L	790223	CHIP RESISTOR 15KOHM+-5% 1/16W	For No. JA2296-7
	R6113L	790223	CHIP RESISTOR 15KOHM+-5% 1/16W	For No. JA2296-8
	R6113R	790223	CHIP RESISTOR 15KOHM+-5% 1/16W	For No. JA2296-7
	R6113R	790223	CHIP RESISTOR 15KOHM+-5% 1/16W	For No. JA2296-8
	R6114L	790207	CHIP RESISTOR 1KOHM+-5% 1/16W	For No. JA2296-7
	R6114L	790207	CHIP RESISTOR 1KOHM+-5% 1/16W	For No. JA2296-8
	R6114R	790207	CHIP RESISTOR 1KOHM+-5% 1/16W	For No. JA2296-7
	R6114R	790207	CHIP RESISTOR 1KOHM+-5% 1/16W	For No. JA2296-8
	R6115L	AQ10713R	CHIP RESISTOR 100KOHM+-0.5% 1/16W	For No. JA2296-7
	R6115L	AQ10713R	CHIP RESISTOR 100KOHM+-0.5% 1/16W	For No. JA2296-8
	R6115R	AQ10713R	CHIP RESISTOR 100KOHM+-0.5% 1/16W	For No. JA2296-7
	R6115R	AQ10713R	CHIP RESISTOR 100KOHM+-0.5% 1/16W	For No. JA2296-8
	R6116L	AQ10761R	CHIP RESISTOR 47KOHM+-0.5% 1/16W	For No. JA2296-7
	R6116L	AQ10761R	CHIP RESISTOR 47KOHM+-0.5% 1/16W	For No. JA2296-8
	R6116R	AQ10761R	CHIP RESISTOR 47KOHM+-0.5% 1/16W	For No. JA2296-7
	R6116R	AQ10761R	CHIP RESISTOR 47KOHM+-0.5% 1/16W	For No. JA2296-8

Parts List				
Caution	**Symbol No.**	**Part No.**	**Description**	**Note**
	R6117L	AQ10712R	CHIP RESISTOR 10KOHM+-0.5% 1/16W	For No. JA2296-7
	R6117L	AQ10712R	CHIP RESISTOR 10KOHM+-0.5% 1/16W	For No. JA2296-8
	R6117R	AQ10712R	CHIP RESISTOR 10KOHM+-0.5% 1/16W	For No. JA2296-7
	R6117R	AQ10712R	CHIP RESISTOR 10KOHM+-0.5% 1/16W	For No. JA2296-8
	R6118L	790215	CHIP RESISTOR 3.9KOHM+-5% 1/16W	For No. JA2296-7
	R6118L	790215	CHIP RESISTOR 3.9KOHM+-5% 1/16W	For No. JA2296-8
	R6118R	790215	CHIP RESISTOR 3.9KOHM+-5% 1/16W	For No. JA2296-7
	R6118R	790215	CHIP RESISTOR 3.9KOHM+-5% 1/16W	For No. JA2296-8
	R6119L	790214	CHIP RESISTOR 3.3KOHM+-5% 1/16W	For No. JA2296-7
	R6119L	790214	CHIP RESISTOR 3.3KOHM+-5% 1/16W	For No. JA2296-8
	R6119R	790214	CHIP RESISTOR 3.3KOHM+-5% 1/16W	For No. JA2296-7
	R6119R	790214	CHIP RESISTOR 3.3KOHM+-5% 1/16W	For No. JA2296-8
	R6120	790216	CHIP RESISTOR 4.7KOHM+-5% 1/16W	For No. JA2296-7
	R6120	790216	CHIP RESISTOR 4.7KOHM+-5% 1/16W	For No. JA2296-8
	R6201L	790207	CHIP RESISTOR 1KOHM+-5% 1/16W	For No. JA2296-7
	R6201L	790207	CHIP RESISTOR 1KOHM+-5% 1/16W	For No. JA2296-8
	R6201R	790207	CHIP RESISTOR 1KOHM+-5% 1/16W	For No. JA2296-7
	R6201R	790207	CHIP RESISTOR 1KOHM+-5% 1/16W	For No. JA2296-8
	R6203L	790223	CHIP RESISTOR 15KOHM+-5% 1/16W	For No. JA2296-7
	R6203L	790223	CHIP RESISTOR 15KOHM+-5% 1/16W	For No. JA2296-8
	R6203R	790223	CHIP RESISTOR 15KOHM+-5% 1/16W	For No. JA2296-7
	R6203R	790223	CHIP RESISTOR 15KOHM+-5% 1/16W	For No. JA2296-8
	R6204L	790227	CHIP RESISTOR 33KOHM+-5% 1/16W	For No. JA2296-7
	R6204L	790227	CHIP RESISTOR 33KOHM+-5% 1/16W	For No. JA2296-8
	R6204R	790227	CHIP RESISTOR 33KOHM+-5% 1/16W	For No. JA2296-7
	R6204R	790227	CHIP RESISTOR 33KOHM+-5% 1/16W	For No. JA2296-8
	R6205	790181	CHIP RESISTOR 10KOHM+-5% 1/16W	For No. JA2296-7
	R6205	790181	CHIP RESISTOR 10KOHM+-5% 1/16W	For No. JA2296-8
	R6301L	790207	CHIP RESISTOR 1KOHM+-5% 1/16W	For No. JA2296-7
	R6301L	790207	CHIP RESISTOR 1KOHM+-5% 1/16W	For No. JA2296-8
	R6301R	790207	CHIP RESISTOR 1KOHM+-5% 1/16W	For No. JA2296-7
	R6301R	790207	CHIP RESISTOR 1KOHM+-5% 1/16W	For No. JA2296-8
	R6302L	790238	CHIP RESISTOR 220KOHM+-5% 1/16W	For No. JA2296-7
	R6302L	790238	CHIP RESISTOR 220KOHM+-5% 1/16W	For No. JA2296-8
	R6302R	790238	CHIP RESISTOR 220KOHM+-5% 1/16W	For No. JA2296-7
	R6302R	790238	CHIP RESISTOR 220KOHM+-5% 1/16W	For No. JA2296-8
	R6304	790216	CHIP RESISTOR 4.7KOHM+-5% 1/16W	For No. JA2296-7
	R6304	790216	CHIP RESISTOR 4.7KOHM+-5% 1/16W	For No. JA2296-8
	R6308	790234	CHIP RESISTOR 100KOHM+-5% 1/16W	For No. JA2296-7
	R6308	790234	CHIP RESISTOR 100KOHM+-5% 1/16W	For No. JA2296-8
	R6311	790229	CHIP RESISTOR 47KOHM+-5% 1/16W	For No. JA2296-7
	R6311	790229	CHIP RESISTOR 47KOHM+-5% 1/16W	For No. JA2296-8
	R6314	790211	CHIP RESISTOR 1.8KOHM+-5% 1/16W	For No. JA2296-7
	R6314	790211	CHIP RESISTOR 1.8KOHM+-5% 1/16W	For No. JA2296-8
	R6316	790242	CHIP RESISTOR 390KOHM+-5% 1/16W	For No. JA2296-7
	R6316	790242	CHIP RESISTOR 390KOHM+-5% 1/16W	For No. JA2296-8
	R6317	790202	CHIP RESISTOR 390 OHM+-5% 1/16W	For No. JA2296-7
	R6317	790202	CHIP RESISTOR 390 OHM+-5% 1/16W	For No. JA2296-8
	R6318	790202	CHIP RESISTOR 390 OHM+-5% 1/16W	For No. JA2296-7

Parts List				
Caution	**Symbol No.**	**Part No.**	**Description**	**Note**
	R6318	790202	CHIP RESISTOR 390 OHM+-5% 1/16W	For No. JA2296-8
	R6319	790211	CHIP RESISTOR 1.8KOHM+-5% 1/16W	For No. JA2296-7
	R6319	790211	CHIP RESISTOR 1.8KOHM+-5% 1/16W	For No. JA2296-8
	R6324	790229	CHIP RESISTOR 47KOHM+-5% 1/16W	For No. JA2296-7
	R6324	790229	CHIP RESISTOR 47KOHM+-5% 1/16W	For No. JA2296-8
	R6325	790216	CHIP RESISTOR 4.7KOHM+-5% 1/16W	For No. JA2296-7
	R6325	790216	CHIP RESISTOR 4.7KOHM+-5% 1/16W	For No. JA2296-8
	R6326	790181	CHIP RESISTOR 10KOHM+-5% 1/16W	For No. JA2296-7
	R6326	790181	CHIP RESISTOR 10KOHM+-5% 1/16W	For No. JA2296-8
	R6327	790209	CHIP RESISTOR 1.5KOHM+-5% 1/16W	For No. JA2296-7
	R6327	790209	CHIP RESISTOR 1.5KOHM+-5% 1/16W	For No. JA2296-8
	R6328	790181	CHIP RESISTOR 10KOHM+-5% 1/16W	For No. JA2296-7
	R6328	790181	CHIP RESISTOR 10KOHM+-5% 1/16W	For No. JA2296-8
	R6330	790221	CHIP RESISTOR 10KOHM+-5% 1/16W	For No. JA2296-7
	R6330	790221	CHIP RESISTOR 10KOHM+-5% 1/16W	For No. JA2296-8
	R6333	790221	CHIP RESISTOR 10KOHM+-5% 1/16W	For No. JA2296-7
	R6333	790221	CHIP RESISTOR 10KOHM+-5% 1/16W	For No. JA2296-8
	R8001	790207	CHIP RESISTOR 1KOHM+-5% 1/16W	For No. JA2296-7
	R8001	790207	CHIP RESISTOR 1KOHM+-5% 1/16W	For No. JA2296-8
	R8002	790207	CHIP RESISTOR 1KOHM+-5% 1/16W	For No. JA2296-7
	R8002	790207	CHIP RESISTOR 1KOHM+-5% 1/16W	For No. JA2296-8
	R8003	790207	CHIP RESISTOR 1KOHM+-5% 1/16W	For No. JA2296-7
	R8003	790207	CHIP RESISTOR 1KOHM+-5% 1/16W	For No. JA2296-8
	R8005	790073	CHIP RESISTOR 470KOHM+-5% 1/16W	For No. JA2296-7
	R8005	790073	CHIP RESISTOR 470KOHM+-5% 1/16W	For No. JA2296-8
	R8006	790068	CHIP RESISTOR 220KOHM+-5% 1/16W	For No. JA2296-7
	R8006	790068	CHIP RESISTOR 220KOHM+-5% 1/16W	For No. JA2296-8
	R8042	790181	CHIP RESISTOR 10 OHM+-5% 1/16W	For No. JA2296-7
	R8042	790181	CHIP RESISTOR 10 OHM+-5% 1/16W	For No. JA2296-8
	R8043	790181	CHIP RESISTOR 10 OHM+-5% 1/16W	For No. JA2296-7
	R8043	790181	CHIP RESISTOR 10 OHM+-5% 1/16W	For No. JA2296-8
	R8044	790181	CHIP RESISTOR 10 OHM+-5% 1/16W	For No. JA2296-7
	R8044	790181	CHIP RESISTOR 10 OHM+-5% 1/16W	For No. JA2296-8
	R8045	790181	CHIP RESISTOR 10 OHM+-5% 1/16W	For No. JA2296-7
	R8045	790181	CHIP RESISTOR 10 OHM+-5% 1/16W	For No. JA2296-8
	R8046	790181	CHIP RESISTOR 10 OHM+-5% 1/16W	For No. JA2296-7
	R8046	790181	CHIP RESISTOR 10 OHM+-5% 1/16W	For No. JA2296-8
	R8047	790181	CHIP RESISTOR 10 OHM+-5% 1/16W	For No. JA2296-7
	R8047	790181	CHIP RESISTOR 10 OHM+-5% 1/16W	For No. JA2296-8
	R8048	790181	CHIP RESISTOR 10 OHM+-5% 1/16W	For No. JA2296-7
	R8048	790181	CHIP RESISTOR 10 OHM+-5% 1/16W	For No. JA2296-8
	R8049	790181	CHIP RESISTOR 10 OHM+-5% 1/16W	For No. JA2296-7
	R8049	790181	CHIP RESISTOR 10 OHM+-5% 1/16W	For No. JA2296-8
	R8050	790181	CHIP RESISTOR 10 OHM+-5% 1/16W	For No. JA2296-7
	R8050	790181	CHIP RESISTOR 10 OHM+-5% 1/16W	For No. JA2296-8
	R8051	790024	CHIP RESISTOR 100 OHM+-5% 1/16W	For No. JA2296-7
	R8051	790024	CHIP RESISTOR 100 OHM+-5% 1/16W	For No. JA2296-8
	R8052	790194	CHIP RESISTOR 100 OHM+-5% 1/16W	For No. JA2296-7
	R8052	790194	CHIP RESISTOR 100 OHM+-5% 1/16W	For No. JA2296-8

Parts List				
Caution	**Symbol No.**	**Part No.**	**Description**	**Note**
	R8053	790181	CHIP RESISTOR 10 OHM+-5% 1/16W	For No. JA2296-7
	R8053	790181	CHIP RESISTOR 10 OHM+-5% 1/16W	For No. JA2296-8
	R8061	790185	CHIP RESISTOR 22 OHM+-5% 1/16W	For No. JA2296-7
	R8061	790185	CHIP RESISTOR 22 OHM+-5% 1/16W	For No. JA2296-8
	R8062	790185	CHIP RESISTOR 22 OHM+-5% 1/16W	For No. JA2296-7
	R8062	790185	CHIP RESISTOR 22 OHM+-5% 1/16W	For No. JA2296-8
	R8063	790185	CHIP RESISTOR 22 OHM+-5% 1/16W	For No. JA2296-7
	R8063	790185	CHIP RESISTOR 22 OHM+-5% 1/16W	For No. JA2296-8
	R8064	790185	CHIP RESISTOR 22 OHM+-5% 1/16W	For No. JA2296-7
	R8064	790185	CHIP RESISTOR 22 OHM+-5% 1/16W	For No. JA2296-8
	R8065	790185	CHIP RESISTOR 22 OHM+-5% 1/16W	For No. JA2296-7
	R8065	790185	CHIP RESISTOR 22 OHM+-5% 1/16W	For No. JA2296-8
	SW8001	FB10741R	SWITCH	For No. JA2296-7
	SW8001	FB10741R	SWITCH	For No. JA2296-8
	T0501	BC10571R	TRANS	
	X4001	BL11973R	CRYSTAL	
	X4002	BL12201R	CRYSTAL	
	X5001	BL12211R	CRYSTAL	For No. JA2296-7
	X5001	BL12211R	CRYSTAL	For No. JA2296-8
	ZD8001	CC02086R	DIODE TE61	For No. JA2296-7
	ZD8001	CC02086R	DIODE TE61	For No. JA2296-8

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